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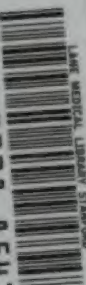
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THE
AMERICAN YEAR-BOOK
OF
MEDICINE AND SURGERY

BEING

A Yearly Digest of Scientific Progress and Authoritative
Opinion in all Branches of Medicine and Surgery
drawn from Journals, Monographs, and Text-
Books of the Leading American and Foreign
Authors and Investigators

COLLECTED AND ARRANGED

WITH CRITICAL EDITORIAL COMMENTS

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UNDER THE GENERAL EDITORIAL CHARGE OF

GEORGE M. GOULD, M.D.

SURGERY

PHILADELPHIA AND LONDON

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1905

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PREFACE.

Not only the YEAR-BOOK and its readers, but the American profession and people have suffered a great loss in the death of Dr. S. W. Abbott of Boston. His manuscript had been received and the proofs had passed through his hands before his death. His department in our work—that of Public Hygiene and Preventive Medicine—will next year be in the charge of Dr. John S. Fulton of Baltimore, at present the Secretary of the State Board of Health of Maryland, and Editor of the Maryland Medical Journal. Subscribers may therefore feel assured that the advances in hygiene will be perfectly collated and edited. Dr. J. Leslie Davis begins this year his connection with the work, in conjunction with Dr. Kyle, in the department of Laryngology, etc., in place of Dr. Fetterolf, who has resigned.

In view of many works similar to this one epitomizing the advances made in Medicine and Surgery which have been undertaken since the YEAR-BOOK was started, it is a source of gratification to know that the members of the profession continue to show their appreciation of the conscientious and hard labor put into their difficult task by the departmental editors of the AMERICAN YEAR-BOOK OF MEDICINE AND SURGERY. With the unchecked increase of the amount of our literature the difficulty grows continuously greater of keeping the size of the volumes from becoming too bulky.

GEORGE M. GOULD.

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GENERAL SURGERY.

By J. CHALMERS DACOSTA, M.D., AND JOHN H. GIBBON, M.D.,
OF PHILADELPHIA.



SURGICAL TECHNIC.

Charles Leedham Green¹ presents a most exhaustive experimental study on the **sterilization of the hands**, dealing with the various methods which have been devised, and reaches the following conclusions: "(1) That, even after the most prolonged and energetic washing of the hands in soap and hot water, it is not possible materially to diminish the number of microbes on them. (2) The same conclusion holds good whether sea-sand, marble-dust, or Schleich's soap be employed. (3) There is no advantage to be gained by unduly prolonging this washing process, as the hands never become sterile, and, owing to the loosening of the epidermis, generally appear more infected after than before the washing. (4) Neither is there any advantage offered by the use of soft soap, or soap containing an excess of free alkali. Any increase in detergent action is more than counterbalanced by its irritating effect upon the skin. (5) The water should be used as hot as it can be borne, and it should be frequently renewed. After washing, the hands may, with advantage, be rubbed with a dry, rough, sterile cloth to assist in the removal of the superficial cells of the epidermis. (6) The use of turpentine, benzolin, or xylol during or after the washing with soap and hot water does not appreciably improve the results. (7) The aqueous solutions of carbolic acid, lysol, perchlorid or biniodid of mercury are practically powerless to affect the microorganisms situated on the hands, and the use of these antiseptics after a thorough preliminary washing of the hands utterly fails to render them sterile. (8) The use of a saturated solution of potash permanganate, followed by the application of strong oxalic acid (Kelly's method), gives wholly inadequate results. (9) The bacteriologic power of the new antiseptic subblamin is considerably below that of mercury perchlorid, and, as a sterilizing agent for the hands, is of little value, and cannot be compared in efficiency with the alcohol-sublimate method of Fürbringer, which it was introduced to supplant. (10) The combination of an antiseptic like lysol or mercury biniodid with a soap does not increase the power of the antiseptic, but rather tends to lower it. Such soaps are practically valueless for the cleansing of the hands. (11) Alcohol possesses a remarkable power of sterilizing the hands, far sur-

¹ Birmingham Med. Rev., Apr., 1904.

passing that of all other agents. In order to obtain the full benefit of the spirit method, it is necessary to employ the alcohol for from 4 to 5 minutes; and the whole procedure must be carried out with vigor and intelligence. (12) Unless the hands are in an exemplary cosmetic condition, good results cannot be obtained by any method. A roughened or chapped hand does not admit of disinfection. (13) As the result of my experiments, I am forced to conclude that, though the spirit be employed for not less than 5 minutes, and the hands be in an exemplary cosmetic condition, yet a perfect sterility cannot be obtained, and, in a considerable proportion of cases, the hands are still surgically infective. When the hands have been recently infected with septic matter, the likelihood of their being rendered sterile is greatly diminished. (14) Spirit soap is greatly inferior to plain alcohol as a cleansing agent; and the addition of mercury biniodid or lysol to this soap does not materially increase its value. (15) The power which alcohol possesses of sterilizing the hands is principally due to its property of hardening and fixing the superficial cells of the epidermis; in addition to which it has a marked bactericidal action. (16) With the exception of absolute and very high percentages of alcohol, the spirituous solutions of antiseptics (mercury perchlorid) are markedly superior to the aqueous solutions in sterilizing power. The efficiency increases in direct ratio to the percentage of alcohol in the solution up to about 70 %, when any further increase in the proportion of the alcohol causes a reduction in the sterilizing power of the antiseptic. (17) It is an advantage to replace the watery antiseptic solution in Fürbringer's method by 70 % sublimate-alcohol. It is a more powerful bactericide, and it does not reduce the hardening of the epidermis by the previous alcohol. (18) Of all the methods tested, the best results were obtained by the following modification of Fürbringer's process: (a) The hands are first scrubbed for 5 minutes with soap and very hot water (about 50° C.)—the water to be frequently changed. The use of sterile sea-sand as an addition to the nail-brush is an advantage. (b) The hands are then rubbed with methylated spirit for 3 minutes. (c) Afterward scrubbed for a minute or two with 70 % sublimate-alcohol (1 : 1000). (d) And finally rubbed until dry and polished with a sterile cloth. (19) Hands which have proved practically sterile directly after the cleansing process gradually become more and more infective, as, under the imbibition of the water, the alcohol-hardened epithelium is loosened. (20) As no method of cleansing the hands guarantees sterility, it is desirable that impermeable gloves be worn when the nature of the operation permit, whether the wound be aseptic or septic. In the former case they protect the patient, in the latter the surgeon, from risk of infection. (21) When gloves cannot be tolerated on account of the loss of tactile sensation they cause, the epidermis of the hands may be protected to some extent from direct contact with septic matter by a thin layer of hard paraffin. (22) A period of abstention from operative work after contact with especially virulent septic matter is desirable."

A method of dispensing with rubber gloves and the adhesive

rubber dam is described by John B. Murphy,¹ who has endeavored to find a material which might be applied to the hands of the surgeon and the skin of the patient and which would practically seal these surfaces with an insoluble and impervious and practically imperceptible coating, and at the same time one that will not interfere with the sense of touch or impair the pliability of the skin. He has ascertained that a 4 %, 6 %, or 8 % solution of guttapercha in benzene fulfils all these requirements, while a similar solution in acetone also meets most of the requirements. He finds that the 4 % solution of rubber in benzene is the most serviceable for the hands, as it wears better than the acetone solution. The acetone solution, however, is more advantageous for the abdomen, as it dries in from 3 to 4 seconds after its application, while the benzene application takes from 2 to 3½ minutes to dry to a firm coating. The method of application to the hands and forearms is that of simple washing as with alcohol, care being taken to fill in around and beneath the nails. The hands must then be kept exposed to the air with the fingers separated until thoroughly dry. They may then be washed in alcohol, mercuric chlorid, or any of the antiseptic solutions without interfering with the coating or affecting the skin. It wears off on the tips of the fingers if the operations be many or prolonged, when another application may be made between operations; on the remaining portion of the hands one application is sufficient for a whole morning's work. The coating is so thin that it can be recognized only by its glazed appearance. It is removed by washing in benzene. The guttapercha solution is prepared by dissolving pure guttapercha chips in sterile benzene or acetone. These solutions do not stand boiling, as it impairs the adhesiveness and elasticity of the coating. In addition to the bactericidal properties of the benzene it prevents perspiration beneath the coated surface, and also the rubbing-off of epithelia from the hands and skin surface into the wound. It does not puncture like the rubber glove, and where it wears off on the finger-tips there is no accumulated epithelium or secretion beneath. It is, moreover, impermeable and precludes the ingress of infective flora or blood to the operator's skin. After operating, the surface washes clean as readily as the surface of a rubber glove. At the end of the day's work, when the hands are washed in benzene to remove the coating, the skin is very soft and smooth. Inoculation and bacteriologic tests are being made and will be reported in detail later.

A communication from Wm. Flegenheimer² (Richmond, Va.) on the subject of **Murphy's substitute for rubber gloves** states that he has found two objections to the method, one being the explosive nature of benzene and the other its disagreeable and penetrating odor. These disadvantages can be overcome by using chloroform instead of benzene as a solvent for the guttapercha. It is quicker, safer, less disagreeable, and nonexplosive. The solution is used in every respect as is that of Murphy. The only objection which can be raised to chloroform is the price. Commercial chloroform, however, can be used and is comparatively cheap.

¹ Jour. Am. Med. Assoc., Mar. 19, 1904.

² N. Y. Med. Jour., Apr. 16, 1904.

The **danger of infecting wounds by talking over them during operation** is discussed by Mendes de Leon,¹ who conducted a series of experiments in order to determine as far as possible the dangers of wound infection from this source. He prepared a special sterilized receptacle into which he talked for an average length of time. In not a single instance did he fail to develop a number of pus-producing germs. The virulence of the germs was proved by injections into 61 animals. It is suggested that this danger may be avoided in two ways—by sterilizing the mouth with antiseptic solutions and by protecting the mouth with a mask. The former is unsatisfactory, but after constructing a mask to fit the face repeated experiments showed that no infection was produced.

Heile² (Breslau) discusses the **antiseptic action of iodoform**, taking as the basis for his article the inquiry, "Why does iodoform prove a good antiseptic in the clinic and in the laboratory lag behind all other antiseptics in virtue?" His investigations show that when mixed with the juices of the tissues in the absence of oxygen iodoform becomes decomposed in from 3 to 5 days and then kills both staphylococci and streptococci. Granulation tissue acts similarly to the juices of organs, and tuberculous granulation tissue seems to have a most intense decomposing power. The antiseptic action of iodoform corresponds to the amount of iodine which is set free, and yet its antiseptic action is not due to the free iodine, since iodine is set free in the presence of oxygen and iodoform is no longer an antiseptic when oxygen is present. Heile thinks that it is probably the decomposition of iodoform which sets free di-iod-acetylene. This is a very strong germicide and is rendered inert by oxidization. These experimental findings correspond to clinical experience in that iodoform is of much value in cavities and of none in superficial wounds. In internal organs the drug is most powerful. Heile concludes that iodoform is one of our best antiseptics, if not the best. [One reason for the apparently unreconcilable views of the laboratory worker and the surgeon has been pointed out by Lowry. It is that in many instances the laboratory worker has used in his experiments nutrient material in which iodoform is not soluble.]

J. v. Torok³ reports **excellent results from the use of a new antiseptic dusting-powder** called **lycosin-quinin**, which is a combination of quinine and di-o-oxy-dibenzol acetone. It is used as a dusting-powder and may also be impregnated in gauze. It may be employed in all instances where an antiseptic powder is desired.

Kraske,⁴ while acknowledging the advantages of the **Trendelenburg posture**, points out certain **dangers** of this position. He refers to 2 cases of suprapubic cystotomy in which this position was used and in which there was a fatal increase of the existing myocarditis. Kraske thinks that the posture causes increased hydrostatic pressure and a flow

¹ Arch. f. klin. Chir., Bd. lxxii, Heft. 4.

² Proceedings of the German Surgical Congress, 1903, Ann. of Surg., Dec., 1903.

³ Deut. med. Woch., Oct. 29, 1903.

⁴ Proceedings of the German Surgical Congress, 1903, Ann. of Surg., Dec., 1903.

of blood from the inferior vena cava sufficient to cause an acute irreparable dilation of a feeble heart. In two other cases of very fat persons he saw intestinal obstruction follow suprapubic lithotomy done in the Trendelenburg position. Kraske believes that the position should be discarded when serious myocardiac disease is present, and that when the intestinal tract and omentum are loaded with fat, the position should be employed with caution and for as short a time as possible.

Trendelenburg, who discussed this paper, does not think that Kraske's conclusions are warranted, and states that he never saw ileus follow the use of the position, although he admits the possibility. He states that in bellies loaded with fat the position is of little value. He has noticed gastric hemorrhage after the use of the position.

Several other surgeons referred to cases presenting postoperative complications after the employment of this position, and Künnel (Hamburg) stated that he never saw ill results from the use of the position and did not believe that it would give rise to ileus. [In this debate von Eiselsberg stated that he lowers the table as soon as possible and that he has seen gastric hemorrhage occur after a patient has been long in the Trendelenburg position. Koenig pointed out that it is dangerous in cases of intraabdominal abscess. We believe that in myocardial conditions and cyanotic states it is not a safe position, and we always follow the advice of Lowenstein, and return the patient to the horizontal position and spread out the omentum before we close the abdominal incision.]

Guy C. Kinnaman¹ (Chicago) describes an exhaustive **experimental research into the temperature relationship existing in shock**. After extensive experiments upon animals he reaches the following conclusions: "Shock must not be considered as due to the lowering or exhaustion of one bodily function, but as a composite condition embracing an interference with the normal height of the blood-pressure (lowering), an interference (lowering) with the respiratory act, and a marked fall in the body-temperature. Of these, as shock increases in severity, the most uniform and progressive factor is the fall in temperature. That there is a relationship existing between the fall in body-temperature and shock is evident by considering: (1) That in one series the fall in temperature *was* the *sole* cause of shock; (2) that centigrade (average), the respirations were increased instead of diminished, and the fall in blood-pressure was greatly lessened; (3) that by raising the body-temperature, previously lowered in shock, the respiratory rate was increased and the blood-pressure raised. This relationship may be thus expressed: (a) A sufficient fall in the body-temperature *can* cause a decrease in the respiratory rate and a marked fall in the blood-pressure, which, together with itself, we designate as shock. (b) Conversely, a limiting of the fall limits the fall in pressure and prevents a fall in the respiratory rate. Therefore shock is limited or prevented. (c) Antagonistically, a rise of the temperature causes a rise in the blood-pressure and the respiratory rate (reduced in shock), with the result of a gradual amelioration of all the symptoms. Thus, of the three factors concerned, the temperature

¹ Ann. of Surg., Dec., 1903.

commands first place by its power of production, by its power of limitation, and by its power of amelioration of the composite condition—shock.”

John M. Fisher¹ (Philadelphia) describes what he calls the **gauze-bearing tape and the gravity pad in pelvic and abdominal surgery**. By the former is meant a tape on which is threaded each abdominal pad as it is passed into the wound. By the use of this tape the surgeon is saved all fear and anxiety regarding the number of pads which he uses, as there is no danger of any of the pads being lost in the abdomen. The gravity pad is a large gauze pad which has concealed within its folds and fastened to its center a lead plate measuring 2 by 3 inches and weighing a half pound. The object of this device is that of holding the intestine in the upper portion of the abdomen in pelvic operations. It is said to be particularly useful in those cases in which there is considerable coughing or muscular rigidity.

Hopmann² describes a **new operation for puerperal mastitis**. The method consists in making a semicircular incision along the lower border of the breast, lifting the gland up from the pectoral fascia, opening the abscess freely, and draining it through one or more tubes. The tubes lie in the most favorable position for drainage, and after healing the scar is covered by the pendulous portion of the gland. Deep abscesses which are opened from the front drain with difficulty, but are easily treated by this method. [We do not regard this as a new method, as we have seen it practised by others and have employed it ourselves. It is often a very useful method, particularly in retromammary abscess.]

Bechtol³ (Chicago) describes an **easily detachable plaster-of-Paris cast**. In short, the method consists simply in applying a Gigli wire saw along the anterior and posterior surfaces of the leg and along the sole of the foot. When the plaster is dry, it is cut with the three saws so as to make two lateral splints which can be fixed with bandages or adhesive strips and removed whenever desired.

AMPUTATIONS.

Walter G. Spencer⁴ urges the **necessity of shortening large nerves when performing amputations**, and reports 6 cases in which secondary operations, varying from resection of nerve-stumps to reamputation, were necessary after primary amputations in which the nerves had not been shortened. When the nerves are not drawn out and cut off, the stump is apt to be painful and the patient may not be able to wear an artificial limb or return to his work. When the nerves are shortened at the time of operation, these postoperative complications seldom arise. [We think surgeons, as a rule, are in entire accordance with Mr. Spencer. The elder Senn says in his “Practical Surgery”: “No amputation above the ankle- and the wrist-joint is complete without primary exsection of the principal nerve-trunks in the amputation wound.” If this is not

¹ Ann. of Surg., Dec., 1903.

² Zent. f. Chir., Aug. 1, 1903.

³ Jour. Am. Med. Assoc., Sept. 5, 1903.

⁴ Brit. Med. Jour., July 11, 1903.

done some weeks or a few months after amputation, a neuroma forms in the end of each divided nerve; it will be surrounded by scar, and in most cases, as Witzel pointed out, the neuroma is found adherent to the end of the bone.]

E. Harrison¹ reports a case of **primary quadruple amputation with recovery**. The patient was a man 29 years of age, who was admitted to the hospital in great shock after being run over by a train, the four extremities being horribly crushed. He was anesthetized, an intravenous infusion of salt-solution was given, and Harrison amputated the two lower extremities while an assistant amputated both forearms. The right leg was amputated about 4 inches below the knee; the left thigh, about the junction of upper and middle third, while both forearms were amputated about 2 inches above the wrists. The patient made a prompt recovery after operation, all the wounds healing by first intention.

Another case of **primary quadruple amputation with recovery** is reported by J. T. Williams.² The amputation in this case was for a crush of the extremities. Williams performed all the amputations himself. Both arms were amputated through the middle of the humerus. Syme's operation was done on one foot and Chopart's operation on the other.

Dietel³ recommends the employment of the **Achilles tendon as a covering for the tibia in amputation of the leg**. The tendon and muscular attachment can be reflected and then brought across the sawed tibia and sutured in this position. Dietel claims that when this is done and the stump properly treated after the operation, it results in the formation of a stump which bears the weight of the body perfectly, and that it can be laced onto an artificial foot without any straps above the knee, the weight being borne directly on the end of the stump. Stress is laid upon the after-treatment, which should consist of early and vigorous massage of the stump and passive motions of the knee-joint.

Moschcowitz⁴ describes a new **osteoplastic amputation at the ankle-joint**, applying to this amputation the principle of Bier. He states that in all amputations it should be the object of the surgeon to leave nowhere the exposed sawed surface of the bone. The accompanying illustrations (Figs. 1, 2) show the way in which this can be obviated in the amputation under discussion.

A case of **interscapulothoracic amputation for sarcoma** is reported by Powers⁵ (Denver). The patient was a man 56 years old, who fractured his humerus in September, 1902. In December of the same year he noticed a small lump about the seat of the fracture. In February, 1903, a diagnosis of sarcoma was made and amputation at the shoulder recommended. The patient would not consent, however, until after various palliative measures had been employed. In June, 1903, he consented to operation, but at this time the growth had extended so widely that

¹ Brit. Med. Jour., Feb. 20, 1904.

² Brit. Med. Jour., June 11, 1904.

³ Deut. Zeit. f. Chir., Feb., 1904.

⁴ Ann. of Surg., May, 1904.

⁵ Med. News, Jan. 23, 1904.

the only feasible operation was an interscapulothoracic amputation. Powers resected the middle half of the clavicle, divided the pectoralis major muscle, and then ligated the subclavian vessels. Because of the extension of the growth anteriorly flaps had to be fashioned from the back. Before dividing the cords of the brachial plexus they were injected with a 0.25 % solution of cocain and the division not made until 2 minutes later. There was no change in the pulse when these nerves were divided. The operation occupied 57 minutes, and the patient was in good condition at its close and made a perfect operative recovery. The albumin which was present in considerable amount in the urine before the operation, disappeared after the operation. An examination of the growth showed it to be a round-celled sarcoma. After the opera-



Fig. 1.—Osteoplastic amputation at the ankle-joint. Diagram showing portions of bone to be excised.



Fig. 2.—Osteoplastic amputation at the ankle-joint. Diagram of stump after suturing the two osteoperiosteal flaps.

(Moschcowitz, in *Ann. of Surg.*, May, 1904).

tion the patient improved in general health and gained 8 pounds in weight. He died, however, on January 10, 1904, from a metastatic sarcoma of the hip. When the growth was examined after the operation, it was found that the humerus was broken at the site of the disease. Powers believes that the original fracture united, a sarcoma developed at the site of the fracture, and that a pathologic fracture followed. It is possible, however, that the latter fracture took place during the amputation. It is stated that the division of the pectoralis major early in the operation as suggested by Lund, renders ligation of the subclavian vessels much simpler. In 19 cases of this operation recorded since 1890 and collected by Bailey there were no operative deaths.

A case of interscapulothoracic amputation for sarcoma of the

scapula is briefly reported by Thomas F. Hopgood.¹ The patient made a prompt recovery after the operation. One of the first steps in the operation was to divide the clavicle and ligate the subclavian artery. [In these operations the procedure usually followed has been preliminary ligation of the subclavian artery. Le Conte,² in his well-known paper upon this operation, advocates exposure of the axillary artery as high up as possible and the application of a temporary ligature—the elevation of the arm to empty it of blood, then the application of a permanent ligature to the third part of the subclavian artery, division of the artery, and ligation of the vein.]

Another case of **interscapulothoracic amputation** is reported by W. G. Clark.³ The patient was a Matabele girl 18 years of age who was suffering from a sarcomatous growth of the left shoulder. The growth was of 3 months' duration. In endeavoring to show her strength at lifting, the girl broke her humerus 2 days before admission to the hospital. The inner third of the clavicle was not taken away in the operation, but the rest of the bone, the upper extremity, and the scapula were removed. The patient made a prompt recovery. The large vessels in this case were ligated early in the operation.

Hip and thigh amputations for sarcoma of the femur are compared by George F. Shrady⁴ (New York), who reports a unique case of subperiosteal sarcoma of the femur in which an amputation through the upper portion of the femur was done in 1882, and in which since then there has been no recurrence. The patient was 22 years of age at the time of the operation. The hip-joint amputation would have been done in this case but the patient would not consent. The length of time without recurrence renders the case noteworthy. The result is attributed to the fact that at the time of the operation the growth was absolutely localized in the bone and circumvallated. Before performing the amputation in this case a preliminary incision was made in order to verify the diagnosis. Some authorities advise against preliminary incision, as it may result in the dissemination of the cells of the sarcoma. Shrady contends, however, that this is dangerous only when there is an interval between the exploratory incision and the radical operation. If the latter follows the former promptly, there is no danger. Shrady has been able to discover only 11 cases in which patients have remained well more than 3 years after amputation at the hip for sarcoma. Disarticulation at the hip for sarcoma is not opposed, but in the less malignant forms of sarcoma and when the disease is limited, the amputation through the bone may be sufficient. [In contrast to Shrady's views, see the opinions of Coley as set forth in the following abstract.]

Wm. B. Coley⁵ discusses **amputation at the hip-joint for sarcoma** and reports 7 cases without mortality. During 14 years Coley has observed 17 cases of sarcoma of the femur and 22 of sarcoma of the thigh. The majority were hopelessly inoperable. In 11 instances,

¹ Brit. Med. Jour., Apr. 9, 1904.

² Ann. of Surg., Oct., 1902.

³ Lancet, Feb. 6, 1904.

⁴ Med. Rec., Apr. 2, 1904.

⁵ Amer. Med., Jan. 9, 1904.

however, a high amputation was performed, 7 at the hip-joint and 4 just below the trochanter. In the hip-joint amputations the sarcoma started in the bone or periosteum in 5 cases, and in the muscles or fascias in 2 cases. The ages varied from 6 to 60 years. Of the 5 cases of sarcoma of the femur treated with hip-joint amputation, 2 of the patients died within a year, one lived 2 years, one could not be traced, and one, a recent case, is still alive. Of the 4 cases treated by high amputation, one patient with sarcoma of the femur died 4 months later; a second, with sarcoma of the femur, had a local recurrence at the end of 1½ years, when disarticulation was performed and the patient lived 2 years longer; the third case was a multiple melanotic sarcoma of the skin of the thigh, the patient dying 4 months later; the fourth case was a recurrent sarcoma of the thigh primary in the tarsus: in this case there was a local return in the gluteal region which disappeared under the use of the mixed toxins. This patient is alive and well 6 years after amputation. Success after high amputation for sarcoma of the femur is so rare that Coley relates briefly 6 cases with which he is acquainted. The results of these operations in preantiseptic days were better than they are now, because the wounds became infected, and on this account Coley recommends the use of the toxin treatment as a prophylactic after all cases of primary amputation. Coley does not believe with Bloodgood that resection of the bone for sarcoma is advisable. He says: "The procedure might, perhaps, be worthy of a trial in slowly growing myeloid sarcoma of the tibia, the radius, and ulna, but to extend it to periosteal sarcoma of the femur I believe would be most unwise. In the latter case the disease is so highly malignant and extends so far beyond the macroscopic limits, that it would be almost impossible to be sure of its entire removal by resection." Reference is made to a case in which, although there was no macroscopic appearance of the disease on cross-section of the bone 6 inches below the head, there were microscopic evidences in the head of the bone. The chief danger in sarcoma of the femur lies in the remarkable tendency to early metastasis, which is especially true of periosteal growths. In many cases Coley believes that a generalization of the disease had already taken place before the operation. Exploratory incision to confirm the diagnosis should be done only when the patient is on the operating table prepared for a radical operation. The following are Coley's conclusions: "(1) Sarcoma of the femur is a malady so dangerous to life, so prone to early metastasis, that only the most radical operation should be performed, and that at the earliest possible moment. (2) Hip-joint amputation is to be preferred to resection or to amputation through the shaft. (3) Recurrence being the almost invariable rule after all methods of operation, a thorough course of mixed toxin treatment after operation, as a prophylactic, offers the best hope of permanent cure." [For further discussion of sarcoma of the femur, see the section on Cysts and Tumors.]

Cornelius A. Griffiths¹ describes an **amputation at the hip-joint** done for an **enormous sarcoma of the femur**. He employed the

¹ Brit. Med. Jour., Dec. 19, 1903.

tourniquet forceps devised by Lynn Thomas. In this case the flap was a racquet-shaped one, and through the first portion of the incision above the great trochanter one blade of the forceps was passed parallel with Poupart's ligament and underneath the vessels. In this manner the vessels in the anterior flap were thoroughly controlled. One blade of the other pair of forceps was passed behind the neck of the femur and was placed so as to control all the bloodvessels in the posterior flap. By this means practically no blood was lost and the patient made a prompt and satisfactory recovery.

C. M. Nicholson¹ (St. Louis) reports a case of **disarticulation of the hip-joint for rapidly growing sarcoma of the femur** in a boy 8 years of age. The growth was a small round-celled sarcoma containing larger round-cells and spindle-cells. The growth apparently arose from the osteoblastic layer separating the periosteum from the bone. The medullary canal and bone-marrow were apparently normal. The patient made a good operative recovery and 12 months after the operation showed no recurrence and a gain of 22 pounds in weight.

Report of a case of **interilioabdominal amputation for sarcoma of the ilium and a synopsis of previously recorded cases** is presented by W. W. Keen and J. Chalmers DaCosta.² The first portion of this report consists in a clinical lecture by DaCosta in which the differential diagnosis of the condition is thoroughly discussed. The patient was a white man aged 42 years. His family history was entirely negative. Seven months before his admission to the hospital the patient slipped and fell, but did not strike his left side. He felt, however, that something gave way and experienced a sharp pain about the left hip and iliac crest. After the accident he was able to work all day. The next day, however, the pain was so great that he was obliged to stay at home. Within the next few days the pain completely disappeared. Two months after the accident a lump the size of a walnut was discovered below and external to the crest of the ilium. This mass gradually increased in size until it attained the dimensions of a large orange. It was irregularly hemispheric, situated external to the crest and posterior to the anterior superior spine of the left ilium. By careful discussion of the history and of the physical signs DaCosta showed that the growth must be a sarcoma. In order to confirm the diagnosis he introduced an exploring needle and withdrew only blood.

The latter part of the report is a clinical lecture by Keen delivered at the time of the operation, in which he was assisted by DaCosta. Billroth performed this operation for the first time in 1891, the patient surviving but a few hours. Jaboulay was the first, however, to make a formal report on such an operation, which he did in 1894. When the entire ilium is removed the term "interilioabdominal disarticulation" is the proper one to apply to the operation. If, however, a portion of the ilium is left, the operation should be termed an "interilioabdominal amputation." The authors have collected 19 cases of disarticulation

¹ Jour. Am. Med. Assoc., Jan. 2, 1904.

² International Clinics, vol. iv, 13th series.

or amputation: 16 were for sarcoma and 3 for tuberculosis. There were in this series 5 recoveries, described as follows: "Bardenheuer 1, Salistcheff 1, Freeman 1, and Girard 2."

The incision which was employed in this operation is represented in the accompanying cut (Fig. 3). The employment of the form of flap indicated in Fig. 3 was made necessary by the situation of the growth, which would not permit the employment of the flaps suggested by other operators, all of which are described. After making the incision, the next point consisted in the ligation of the internal iliac artery. This vessel, together with the common iliac and external iliac, was exposed without difficulty after stripping back the peritoneum. After ligating the internal iliac an Esmarch bandage was applied to the leg in order to preserve the blood which was then in it. Keen thinks it is a matter of indifference whether the Esmarch bandage is applied before or after the ligation of the artery. The external iliac vein was not



Fig. 3.—Incision employed in interilio-abdominal amputation for sarcoma of the ilium (Keen and Da-Costa, in *International Clinica*, vol. iv, 13th series).

ligated, as the operator did not think it was necessary. After making the long external flap the horizontal ramus of the pubic bone was divided with the chain saw. After dividing the muscles attached to the ilium the descending ramus of the pubes was exposed and divided with a straight saw, and then the ilium was divided with the same saw from the crest to the great sciatic notch. This division completely removed the lower extremity, together with a large portion of the ilium. The external iliac artery and vein were not ligated, but the femoral and deep femoral and several of their branches were ligated near the extremity of the internal flap. The muscles of the two flaps were united to the anterior abdominal wall by buried sutures, and only at one point was there much tension. The skin flaps were then untied after the introduction of drainage. The entire operation occupied 1½ hours.

The patient reacted very well and was in a particularly good condition until about 24 hours afterward, when he became worse and died 9 hours later, or 33 hours after the operation. During these 33 hours his kidneys secreted only 7 ounces of urine in spite of vigorous treatment. Fourteen hours after the operation a putrid odor was detected and the dressings changed, and it was found that the tissues over the buttock supplied by the internal iliac artery and its branches had become gangrenous over an area 10 by 12.5 cm. in extent.

In discussing the interesting points in this case Keen states that in another such case he would follow the advice of Morestin, who advises against the prior ligation of any of the iliacs. Stress is laid upon the advantage of leaving the body of the pubic bone because of the important attachment of the rectus muscle. Keen left the posterior portion of the ilium deliberately for several reasons. He found that in doing this

operation upon the cadaver the most difficult point was the disarticulation. He thinks the danger of recurrence in this portion of the bone is very slight, and that if its removal is necessary, it can be done after the rest of the bone is taken away. The death in this case is attributed to almost complete suppression of urine and the unexpected gangrene. Keen is also rather inclined to agree with Morestin regarding the advantage of first performing a disarticulation at the hip and leaving, in addition to the body of the pubes, the tuberischii. He also feels inclined to abandon the interilioabdominal operation in cases in which it is possible to substitute resection of more or less of the innominate bone, even up to its entire removal, without amputation of the lower extremity, as was first done by Kocher in 1884. "The results in Kocher's and Roux's hands have shown a lower mortality, and the patient can stand and walk. Only, however, in cases of limited neoplasms will this substitution be possible." The microscopic examination made of the growth in this case by Coplin showed it to be an osteosarcoma, the cellular elements composing the growth being of many forms.

Stamm¹ (Remont, Ohio) reports a case of **removal of the lower extremity with half of the pelvis for osteosarcoma.** This operation was done May 15, 1901, and is now reported for the first time. The patient was a man 25 years of age. The disease involved the greater part of the wing of the ilium. The division of the pelvis was done through the rami of the pubis and ischium and through the sacroiliac synchondrosis. The patient survived the operation 5 hours. Stamm thinks that the chiseling through the sacroiliac articulation was productive of great shock. The other portions of the bone were divided with the Gigli saw.

TETANUS, SEPTICEMIA, GANGRENE, ETC.

John Rogers² (New York) recommends the combined **intraneural and intraspinal injection of antitoxin in the treatment of tetanus.** This method of using the antitoxin is based on the experimental work of Marie and Morax, and the later work of Meyer and Ransom. These experimenters have shown that tetanus poison can ordinarily reach the spinal ganglions only through the motor nerves, and it enters them only through the terminal muscle-end apparatus. "Even when the toxin is placed directly beneath the dura of the spinal cord, provided the integrity of the nervous tissue is not disturbed, its course to the cells in the cord is through the lymph and then the blood, and so to the periphery and thence up the nerves before any of the usual results occur." This requires a number of days, but when the toxin is injected directly into the substance of the cord, tetanus is produced within a few hours. "Furthermore, the toxin seems incapable of traveling in any but the motor nerves, and in these only centripetally. It cannot diffuse from above downward. The antitoxin pursues exactly the same course, and an effective means of using it at once suggests itself." It has been shown

¹ Med. News, Aug. 8, 1903.

² Med. Rec., May 21, 1904.

that after tetanus is well developed various methods of introducing the antitoxin heretofore employed have been practically useless. This is due to the fact that before it can reach the spinal centers it must first be carried to the peripheral muscle-end apparatus. With these facts the use of the following treatment seems reasonable—to inject the antitoxin directly into the large nerve-trunks supplying the seat of the original injury, and then, by means of lumbar puncture, to irritate with the needle the cauda equina and inject the antitoxin. Rogers reports a case in which he has employed this treatment successfully. The patient was a boy 12 years of age who received a shot wound of the hand on March 17, 1904. He began to develop tetanic symptoms on April 1, and on April 3 the patient was in the typical opisthotonus position, with all the muscles in tonic contraction. Ether was administered, the lower end of the brachial plexus exposed, and the trunks of all the large nerves injected with from 5 to 10 minims of antitoxin. The wound was closed and a lumbar puncture made. An attempt was made to scratch some of the nerves in the cauda equina and 130 minims of the antitoxin were then injected subdurally. The wound of the hand was then thoroughly cleansed. The next day there was considerable improvement and the treatment was repeated, the wound in the axilla being reopened for the purpose. From this time there was marked improvement, and the patient made a prompt recovery. Rogers thinks that this case might be called one of "delayed acute" tetanus, which he believes to be ordinarily as fatal as the acute form. "The theory, or rather the positive proof, of the way in which the poison reaches the spinal centers through the muscle-end apparatus of the motor nerves, or through a wound of the motor nerves, helps to explain how a case can be both delayed and acute. The poison begins its journey to the center, as apparently in the above case, at the very end of one or more of the motor nerves of an extremity, and so has a long course to travel, and experimentally, at any rate, it does this slowly. A chronic case, or one which generally recovers, probably has the same explanation, with the addition that there are very few bacilli."

The **prevention of tetanus** is the subject of a communication by Daniel N. Eisendrath,¹ who calls attention to the great frequency of tetanus from blank cartridge wounds and urges the prompt and thorough treatment of all wounds likely to be infected with the tetanus bacillus. A number of cases are recorded showing the satisfactory results following the prophylactic treatment outlined by Eisendrath even in the cases in which the tetanus bacillus has been demonstrated in the scrapings from the wound. The following is Eisendrath's summary of his paper: "(1) Early and thorough exposure of every portion of the tract which has been infected by the blank cartridge or instrument which caused the punctured wound, retracting the edges, so that the disinfection and removal of the infected tissues can be done under the guidance of the eye. (2) Prophylactic injections of tetanus antitoxin to aid the organism in combating whatever toxins may have been ab-

¹ Jour. Am. Med. Assoc., May 14, 1903.

sorbed prior to the time of operation. (3) This thorough disinfection can only be carried out under anesthesia, either local or general, and when the parts are rendered bloodless by the application of a constrictor. (4) The blank cartridge itself does not contain tetanus bacilli, but undoubtedly carries them in while penetrating the skin. (5) The instruments which cause punctured wounds either are covered as described above with tetanus bacilli or the manure of horses, etc., and are thus carried into the wound. (6) Our only hope in reducing the high mortality of tetanus is in a thorough application of such radical measures as have just been described."

A special article in the Journal of the American Medical Association of August 29, 1903, presents an extensive review and analysis of the **Fourth of July casualties** of that year, and the question is dealt with extensively in an editorial in the same issue. The importance of this question is indicated when it is shown that as a result of the celebration of this single Fourth of July there were 466 deaths, 10 persons made totally blind, 95 eyes lost, besides 500 other persons maimed and deformed for life. Of these, there were 415 cases of tetanus, and it is believed that this number does not represent the entire list. The greatest source of these casualties is believed to be the blank cartridge, and it is strongly urged that the sale of blank cartridges should be stopped. Attention is called to the fact that the treatment of tetanus in order to be generally successful must be prophylactic, as statistics show that when the antitoxin is used as a prophylactic, tetanus rarely or never presents itself, but that it may not control the disease after it has once become established. "It has been well said that the patient who is just showing tetanic symptoms is not beginning to have tetanus—he is beginning to die from it." Surgeons who have carefully cleansed and drained blank cartridge and firecracker wounds have had few cases of tetanus. Surgeons who have also given antitoxin when the wound was fresh have had none. It is thought that the most promising treatment with the antitoxin is that of intraspinal administration. "It is much less dangerous than the intracranial method, and seems much more logical. The chief manifestations of tetanus come from the injury of the anterior horn cells of the cord—not from the cerebral cortex where the antitoxin is introduced in the intracranial method. There is much reason for believing that the toxin reaches the cord along the nerve-sheaths from the point of injury, rather than by the blood, and it has been shown that the cerebrospinal fluid is more toxic than the blood-serum in tetanus. Therefore, intraspinal injection permits of application of the antitoxin where it would seem to be of greatest value, and it also gives an opportunity for letting escape as much as possible of the highly toxic cerebrospinal fluid through the needle, before injecting the antitoxin. On this last point Luckett lays much stress, and it would seem theoretically to be an important factor."

Wallace Neff¹ (Washington, D. C.) presents a paper on **Furuncle and Carbuncle**. After dealing with the pathology of these conditions he

¹ Va. Med. Semi-Monthly, Mar. 25, 1904.

divides the treatment into preventive, abortive, medicinal, and operative. It is difficult in the beginning to differentiate a furuncle from a carbuncle. In the incipient stage these conditions should not be handled roughly. "If a pimple is squeezed, a boil may be made out of it, and a boil which has been tormented may develop into a carbuncle." Among the abortive measures mentioned is that of the injection of pure carbolic acid. The introduction of a needle heated to a white heat is often effective. The last-mentioned procedure is painful if the needle is red-hot, but is not painful if the needle is heated to a white heat. This method, it is said, will abort a large percentage of boils if done within 3 days. In more advanced cases a single application of caustic potash sometimes checks the process. Constant application of moist heat is another method which may occasionally be successful. Among the medicinal applications ichthyol and lanolin, equal parts, is well spoken of. Equal parts of turpentine and castor oil is a combination which promptly relieves pain and tension, induces free evacuation of pus, prevents extensive inflammation, and promotes healthy granulation after the slough is thrown off. Neither of these remedies alone possesses the efficacy which is shown when the two are combined. Application should be made frequently to the boil or carbuncle. Usually when a furuncle or carbuncle comes into the hands of a surgeon it has been so badly treated that abortion is out of the question. In the case of a furuncle a simple incision with evacuation of contents and a dressing is all that is required; in dealing with a carbuncle, however, free excision is a much better treatment than the old method of crucial incision. The excision should be complete, and Neff advises that the skin-incision should be made with a knife and the operation completed with the actual cautery or thermocautery. All the diseased tissue should be thoroughly removed down to the deep fascia and the wound dressed antiseptically. The effect of this radical treatment is immediate, the pain is relieved, the fever subsides, and delirium, if it existed, disappears. [This method of excision of carbuncles we have employed for several years with most excellent results and can heartily recommend it. We do not believe, however, that it is necessary to employ the actual cautery; in fact, we believe it is better to remove the diseased tissue, after the skin-incision is made, with a curet. Although the bleeding is free, it can be easily controlled by pressure.]

A case of **malignant edema** is reported by Alfred H. Gould,¹ who calls attention to the frequency with which this condition is confused with infection by *Bacillus aerogenes capsulatus* (Welch), the latter being a not unusual condition, but the former being quite rare, as is shown by the fact that there have been only 5 cases reported in the literature of the world in which the infecting bacillus has been proved to be the bacillus of malignant edema. These cases are enumerated. The case reported by Gould is that of a man, a laborer, 49 years of age, who 6 days before admission to the Massachusetts General Hospital received a lacerated wound of the right heel requiring 2 stitches. Two days later

¹ Ann. of Surg., Oct., 1903.

the wound was septic and in a short time a gaseous gangrene developed. The swelling had extended around the ankle 24 hours before admission to the hospital and had begun to spread up the leg. The patient declined immediate operation, but later consented to an amputation at the knee-joint, which was done by J. Collins Warren. At the time of operation the patient's temperature was 99° and his pulse 80. The temperature after operation remained between 100° and 101° for 6 days, but afterward subsided to normal and the wound healed well. Cultures made from the diseased tissue of the amputated leg showed the presence of an obligate anaërobic spore-producing bacillus in addition to other bacteria. This bacillus corresponded in morphologic and cultural peculiarities and in pathogenic effect upon guineapigs with the bacillus of malignant edema. *Bacillus aërogenes capsulatus* (Welch) was sought for but was not found. The bacillus found killed guineapigs within 18 to 24 hours after subcutaneous inoculation. The characteristic lesions in the guineapigs were: subcutaneous hemorrhagic edema, serous exudation in the pleural and in the peritoneal cavities, and moderate subcutaneous gas-formation. The organism was found in the fluids of the subcutaneous tissue, peritoneal and pleural cavities, blood, and spleen.

C. L. Gibson¹ deals with the question of **embolic gangrene of the leg as a sequel of acute lobar pneumonia** and reports 3 cases. These cases were very similar throughout. In each case Gibson believes that a coagulum from the pulmonary veins draining the affected area was dislodged and became arrested, presumably at the bifurcation of the popliteal artery, where it caused obstruction. The onset was sudden in each case, the patient complaining of severe pain in the calf of the leg. The symptoms of vascular obstruction seemed to have developed in all 3 cases suddenly at or about the time of defervescence. The gangrene of the leg was on the same side as the pneumonia; but no significance is attributed to this fact. None of the cases showed any obvious kidney or cardiac changes, nor did the urine contain sugar. The previous histories showed no features of possible interest as etiologic factors. Gibson discusses the possibility of some other intercurrent or accidental process which might account for the condition, but rules them out in favor of the theory already expressed. The gangrene was dry; the typically sudden onset of symptoms was in favor of embolism rather than of thrombosis; the patients showed no obvious vascular or cardiac lesions favoring the theory of the transferring to the leg of an embolism originating in such process. The fact that two of the patients were about 61 and 67 years of age respectively does not give great weight to the theory of thrombosis due to senile changes, because Gibson is able to cite 2 cases of sudden cerebral manifestations following pneumonia occurring in healthy men of 35 or thereabouts. In 2 of the cases the clot only extended a short distance into the tibial vessels. In the treatment of this condition arise two points of interest, first, as to whether or not it is advisable to amputate during the active pneumonic process, and, second, whether we should wait for the establishment of a line of demarca-

¹ Ann. of Surg., Sept., 1903.

tion. Gibson does not feel that it is wise to wait for demarcation if the pulmonary condition favors intervention, and thinks that it is wise to amputate above the knee. Early operation might save more of the leg, assuming that the tendency of the clot once formed is to progress upward quite rapidly, as is shown in one of the cases reported. He believes also that operation should not be undertaken until the lung condition permits. One should not be deterred from amputating at a point where the vessels are found obstructed by thrombi, because the nourishment of the tissues at such a point comes from a higher level. If on division the skin oozes freely, amputation may safely be undertaken at this point. If not, reamputation should be done until this requirement is satisfied. In each of the cases the patient stood the operation well, although in two instances suppuration occurred and in one case reamputation was necessary. The third patient died 6 weeks after operation with symptoms of progressive cardiac exhaustion. The other two patients recovered.

B. Merrill Rickets¹ presents a synopsis and study of 134 cases of **spontaneous and surgical amputation for typhoid gangrene of the lower extremities**. "Of the 134 cases studied, 100 were in males; 34 females; 128 surgical amputations; 3 spontaneous; 3 unknown. There were 65 recoveries after operations; 1 recovery with no operation. There were 22 deaths after operation; 34 deaths without operation; 12 unknown. There were 15 amputations of both legs; 41 of right leg; 20 of left leg; 16 of both feet; 18 of right foot; 16 of left foot; 6 toes; 1 of hand; 3 of middle third of thigh; 3 of upper third of thigh, and 2 of lower third of thigh. There were 20 cases recorded as *dry* gangrene, and 2 as *moist* gangrene; other cases not stated." Gangrene of any part associated with typhoid fever is due to embolism, thrombosis, or inflammation of the veins or arteries or both, but more frequently of the arteries. It may occur at any time during the progress of the disease. When due to inflammation, all the vessels of the extremity are usually involved. In cases of embolism or thrombosis the gangrene is more apt to be localized. Gangrene of the feet and legs when double may be simultaneous. The gangrene may be moist or dry, and slow or rapid in its progress. Metastatic abscesses may form in any of the viscera. Rickets reports a case of his own in which he performed an amputation at the upper third of the thigh for typhoid gangrene extending as high as the middle third of the right leg, in a woman 22 years of age. The patient rallied from the operation and did well for 7 or 8 days, but the gangrene continued to extend in the stump and she died as a result of infection resulting from the gangrene on the tenth day. Rickets does not think it wise to await spontaneous amputation in cases of typhoid gangrene of the extremities except in the case of very old people when both the extremities are involved with dry gangrene, which is slow in development, and when any kind of surgical anesthesia is contraindicated. Surgical amputation should be made as soon as the gangrene is discovered and far enough above the diseased

¹ Va. Med. Semi-Monthly, Mar. 11, 1904.

tissues to be reasonably sure that nothing but healthy tissue, and especially healthy bloodvessels, are divided. It is seldom that general anesthesia is contraindicated. The more favorable cases for amputation are those involving the toes, foot, and lower leg during convalescence. The disease occasionally occurs on the lips, tongue, cheeks, and genitals.

Leonard Gamgee¹ reports a case of **abdominal actinomycosis** occurring in a girl 17 years of age. On April 19 Halsam operated for a large abscess situated around the cecum and appendix, draining the abscess but not removing the appendix. On May 7 dulness was detected over the base of the right lung, and percussion-sounds were heard at the angle of the right scapula. Exploratory puncture was made in the chest but no pus found. Later there developed signs of subdiaphragmatic abscess, and on May 13 a needle introduced through the ninth interspace withdrew pus. An incision was made at this point, and after stitching the pleura to the external wound, an incision was made through the diaphragm and a quantity of pus evacuated. The abscess was bounded by the diaphragm and the upper surface of the liver. The patient survived the operation 3 days. A postmortem examination revealed a gangrenous appendix, and extending from it along the outer side of the colon was a septic tract leading into the right kidney pouch, where there were several ounces of pus. From this point the tract extended between the liver and diaphragm. The liver was found riddled with abscesses full of thick, greenish, offensive pus. They varied in size from that of a pea to a hen's egg. Microscopic examination of the pus revealed actinomyces. There was no ulceration of the cecum. It appears certain to Gamgee that the primary seat of the actinomycosis was in the appendix, and that extension to the liver took place both by direct extension and by means of the veins. As a rule, abdominal actinomycosis has its primary seat in the appendix, the cecum, or the neighboring part of the large or small intestine.

A study of the **mode of infection of man by actinomycosis** with a report of 5 cases is presented by Fritz Maass,² whose conclusions are as follows: "(1) The diagnosis of 'primary pulmonary actinomycosis, even in the absence of all abdominal symptoms, must remain doubtful without a postmortem examination. (2) In abdominal as well as in pulmonary actinomycosis the patient should be closely questioned regarding any previous more or less indistinct symptoms of appendicitis and sores at the anus. (3) Fecal concretions found in the appendix in cases of actinomycosis should be microscopically examined. (4) In actinomycosis following typhoid-like symptoms a Widal test should be made. (5) At the necropsy special attention must be paid to intestinal scars, which may easily avoid detection. (6) Experiments and clinical observation indicate that the fungus cannot enter the human or animal body without a wounded surface. (7) Must the wounded body also be the carrier of the infectious material, or can infection take place secondarily through a granulating accidental wound or the chronic

¹ Birmingham Med. Rev., Jan., 1904.

² Ann. of Surg., Aug., 1903.

ulcers mentioned above? (8) Human actinomycosis of the skin or actinomycosis of the jaw in pasturing cattle may offer a suitable object for investigation in regard to point No. 7."

H. L. Burrell¹ (Boston) deals extensively with **surgical tuberculosis** in an address before the Massachusetts Medical Society. After a thorough consideration of the subject, he reaches the following conclusions: "The prime essentials for the treatment of tuberculosis are physiologic rest, outdoor treatment, and ample nutrition of the patient. Whether the tuberculous area is in the lung, in a joint, in a lymph node, or in the intestines is a detail. When it is possible, the tuberculous area should be excised, especially if it threatens to invade vital structures; combined with the removal of the tuberculous foci, patients should be treated by physiologic rest, fresh air, and sunlight. The excision of a small area from the hip-joint, while it may give a brilliant immediate surgical result as to first intention and a cure, mutilates the patient. On the other hand, by the recognition of physiologic rest and outdoor treatment, such patients may be efficiently treated, and life and limb saved. In the modern construction of hospitals we do not sufficiently recognize the necessity for a maximum of sunlight and air; provision is not made to allow patients in their beds to be moved out on to verandas, that they may be in the air and properly protected."

CYSTS AND TUMORS.

A. T. Bristow² shows the tendency of many pathologists and surgeons to give up a complete acceptance of **Cohnheim's hypothesis as to the origin of carcinoma**. He enumerates certain facts and makes a number of suggestions which point to the parasitic origin of cancer. The proliferation of cells may be explained on the parasitic theory. As instances of cell-proliferation produced by a parasite, actinomycosis, mycetoma, and the infectious granulomas are mentioned. "After all, it is the fact of growth out of proportion to the needs of the organism that needs explanation, and we know that overgrowths do occur in animals, plants, and man as the result of the irritation of parasites. There is, therefore, nothing contrary to reason in supposing that the overgrowth of cancer may be due to the presence of a parasite. One of the strongest arguments that can be brought in favor of the parasitic theory is the occurrence of metastases and the manner of their extension through the blood-channels and lymphatics. It is exactly what we should expect reasoning *a priori* and what happens in known parasitic diseases, such as syphilis, phthisis, and inflammatory processes. Therefore this fact of metastasis harmonizes with the idea of a parasitic origin." The fact that cancer is likely to occur about the orifices of the body is suggestive of an entrance of the disease from without and best harmonizes with the idea of a parasite. Also the fact that cancer has been communicated by inoculation from one animal to another is not easily explained in any

¹ Boston M. and S. Jour., June 25-July 2, 1903.

² Brooklyn Med. Jour., Oct., 1903.

other way than on the supposition that the disease is parasitic. If it is believed that cancer is largely on the increase, that it is endemic, attacking only certain people, and that in certain races in localized areas it attacks the alimentary canal rather than other parts, we are surely brought face to face with a series of facts that can be made to harmonize best with our present knowledge by one supposition. Finally, Bristow does not wish to be understood as claiming that cancer is a parasitic disease. He submits that it is possible for him individually to harmonize more known facts and probable facts concerning carcinoma by the parasitic theory than in any other way.

Keith W. Monsarrat¹ presents the results of his researches on the **etiology of carcinoma** with special reference to the morphology of an organism associated with carcinoma *mammæ* and on the etiologic significance of this association. This work was done under the Scientific Grants Committee of the British Medical Association. The following is a summary of his researches: "(1) From a considerable proportion (58.3 %) of specimens of carcinoma *mammæ* an organism presenting characteristic features was isolated. (2) This organism presents a life-history in which two cycles were traced—the one a vegetable budding cycle, the other a sporulating cycle. (3) The organism when injected into animals is capable of infecting and inhabiting endothelial and epithelial cells. (4) The organism initiates in endothelium and epithelium a process of proliferation, as a result of which masses of new-formed tissue are built up which consist of a parenchyma and a stroma, and grow and extend actively from their centers of origin. (5) This new cell-mass formation may be associated with growth of a similar character in neighboring glands, and some evidence was also provided that visceral metastasis occurs. (6) Intracellular bodies are demonstrable in carcinomata *mammæ*, which present the same features as the intracellular parasites of the experimentally produced nodules. (7) The evidence derived from these researches points to the conclusion that the organism described is an etiologic factor in the morbid process known as carcinoma *mammæ*."

An earnest plea is made for the **parasitic theory of cancer** by Plimmer,² who shows that this theory is not founded entirely upon speculation, but that it has sprung from wider clinical and biologic considerations of the subject, and that we dare not at present give up this theory of the origin of cancer. This theory alone explains epidemics of cancer, its greater frequency in many districts, the occurrence of "cancer houses," its prevalence among those eating uncooked vegetables, its transplantation from one animal to another, etc. The work that has been done in this line is carefully considered by Plimmer, and he concludes that when it is considered it is impossible for us to shut out the parasitic theory, for not only does the origin of the cancer but also its growth and the differentiation of its cells find complete explanation in this theory. He also thinks that if we consider "the clinical course of

¹ Brit. Med. Jour., Jan. 23, 1904.

² Brit. Med. Jour., Dec. 12, 1903.

the disease, its beginning in one spot, its extension to distant parts by lymphatic or blood ways, the cachexia out of all proportion to the extent of the disease, the spread by contagion, the occurrence in certain parts of the body, and its return after years of quiescence, we are driven, from this side, too, on to the parasitic theory, in which (as in no other) all these events find their explanation."

Henry Morris,¹ Chairman of the Cancer Investigating Committee of the Middlesex Hospital, took for the subject of his Bradshaw Lecture **Cancer and Its Origin**. In this address he describes the present status of this question, reviewing and criticizing the various theories regarding the etiology of cancer. He shows first that none of the so-called extrinsic or ectogenous causes, such as chronic irritation, microorganisms, and the various forms of injury, are sufficient in themselves to produce malignant disease. They each, however, may excite the real factor of tumor-formation into activity. Morris says that "neither fission fungus, yeast fungus, nor psorosperm—neither bacterium, blastomycete, nor protozoon—has up to the present moment been satisfactorily shown, in spite of years of patient study by skilled workers, to be in any sort of causal relationship to these diseases." Regarding the transmission of cancer by grafting and direct inoculation it is stated that although experimentation and occasional clinical observation have rather tended to show that transmission can take place, this, however, does not give satisfactory support to the microscopic theories. "From nothing that we know up to the present time of the action of microorganisms could the microbic theory throw the least light upon the cases of alleged transplantation and direct inoculation of cancer from one person to another. How can we, on the microbic theory, explain a glandular-celled carcinoma producing in another person a squamous-celled carcinoma, or a squamous-celled carcinoma of the tongue giving rise to a spheroidal-celled carcinoma of the mamma, or to a columnar-celled carcinoma of the stomach or rectum. Such alleged cases are at total variance with what occurs in autoinoculation, and with all the knowledge we have of the local, regional, and general infection of cancer, as well as with our experience of the action of microbes upon living tissues." The theory of Durante and of Cohnheim receives strong support from Morris, who does not agree with Katze, who states that the acceptance of this theory must be deplored, since the further development of cancer research would have through it no value. This is no argument against the theory, and Morris does not consider that it is true, since if the Cohnheim theory is the correct one, it at least convinces us of the local origin of cancer and of the positive curability of it if removed quite early and completely. Faith in this theory should also encourage the early and more frequent removal even of benign growths. It is in this idea of Durante and Cohnheim that Morris puts most reliance and believes it will shed more and more light on the etiology of cancer with every fresh addition made to the science of embryology and to our knowledge of tumors. [Among practical surgeons the parasitic theory

¹ Brit. Med. Jour., Dec. 12, 1903.

is losing rather than gaining adherents. To say the least, it still falls far short of being a demonstrated truth.]

Adams¹ discusses **cancer in Australia**, making a comparison with other countries, and deals with a specific treatment for the **prevention and arrest of the disease**. The following are his conclusions: "(1) That cancer is not due to a bacterial or parasitic origin; (2) that cancer is a constitutional disease due to a specific or malignant virus originating in the blood and chiefly manifesting itself after 35 years of age and at its greatest virulence between 50 and 70 years of age; (3) that malignant disease may be congenital and certain forms acquired by infection or contagion; (4) that the principal factor in the cause is hereditary tendency; (5) that the principal exciting factor is prolonged local irritation acting on a constitution suffering from an inherited tendency or which has been debilitated through want of treatment of one or other of the following diseases in their order of frequency: syphilis, alcoholism, obesity, rheumatism, gout, or tuberculous disease; (6) that the principal dietetic factors in the cause are sugar, beer, and alcohol; (7) that the principal hygienic factors in the cause are woods and forests whose dropping foliage decomposing causes stagnation of water; also badly formed streets and defective drainage in cities, and the overcrowding, badly housed and fed population of cities; (8) that cancer is a preventable disease and the absolute cure is only to be found in the means for preventing its exciting causes and completely removing the same; (9) that the sanitary indigenous foliage of the following natural orders—(a) myrtaceæ, (b) lauraceæ, and (c) conifere—appears to exert a specific influence in rendering the native-born population of the countries where they grow almost immune from malignant diseases other than might be caused by prolonged local irritation (the Australian eucalypts belonging to the myrtaceæ exert the greatest influence in this direction); (10) that a eucalyptus oil obtained by means of a scientific preparation from various species grown in Australia possesses a specific action in arresting the pathologic progress and process of malignant disease; and (11) that all internal and local treatment of a poisonous or irritating nature should be absolutely avoided, more particularly such local treatment as the x-rays and Finsen's light, as they are likely to set up secondary conditions around the site of lesion. Far better is early and prompt removal when the malignant growth is accessible."

Cheate² presents a further article on the **behavior of cancer within nerve and trophic areas**. His first paper will be found in the **Year-Book of Surgery** for 1904. In this paper he pointed out that there were grounds for believing that the incidence of cancer had possibly a direct or indirect connection with the nerve area attacked by the disease. This idea was based on the thought that it is impossible to omit the subject of irritation from among the etiologic factors of cancer. Squamous epithelioma more often than not begins upon the actual site of irritation. "Again, the incidence of squamous epithelioma and rodent ulcer are very closely associated with the distribution of the fifth cranial nerve.

¹ *Lancet*, Feb. 20, 1904.

² *Brit. Med. Jour.*, Dec. 12, 1903.

When rodent ulcer is multiple, the points of incidence are nearly always on the area or areas of one or both fifth cranial nerves respectively, and chiefly on those parts which are not overlapped by the second cervical spinal nerves." He also called attention to the fact that squamous epithelioma and rodent ulcer often appeared at those points at which nerves become cutaneous. It is this latter point which Cheatle wishes to emphasize in the present paper. Reference is made to the work of Head, who has described points in the peripheral distribution of the posterior spinal ganglions which he calls maximum points, being the foci within the areas of referred pain in visceral disease at which the pain is most acute. Many illustrations are presented to show that the incidence of cancer frequently falls on these maximum points described by Head. Another point made in the paper is that there is a possible direct or indirect nervous influence in directing the areas occupied by cancer. He believes firmly in the possibility of such influence directing the spread of the disease. It is shown by reports and illustrations of numerous cases that rodent ulcers during their progress have divided the nerves and have then not extended in the denervated areas. This point is considered very important, since it has a very particular bearing upon the treatment of the disease. Attention is called to the fact, however, that the abolition of the nerve impulses by the destruction of a peripheral nerve by a cancer is permanent so long as a cancer exists, and that a destruction by excision of a peripheral nerve is not so permanent and that pain and tactile sensations may recur in a spot from which cancer has been excised. Possibly the curative action of the röntgen rays is related to trophic changes which of necessity include nerve changes. Cheatle is unable to say whether or not cancer can genetically arise in a completely denervated area.

A valuable epitome of the history of carcinoma is presented by Roswell Park.¹

In a clinical lecture on epithelioma J. Collins Warren² discusses the relative value of the röntgen rays and radical removal with the knife. In the superficial type of this disease commonly known as rodent ulcer, the röntgen rays have given their best results. In the more deeply seated type, however, such as occurs about the lips and tongue, the rays are not effective. In this variety one is hardly justified in losing valuable time in treating the disease in its early stages with the röntgen rays. It should be treated by prompt extirpation and careful removal of infected lymphatic glands. In the earlier stages of the superficial growths they can usually be removed when the sensation is numbed with a local anesthetic. In the deeper variety a general anesthetic should always be given and a radical operation done. When a superficial ulcer is growing rapidly and shows thickened base or edges, the stage of increased malignancy is close at hand when the growth will spread rapidly. Under such circumstances excision is the only proper treatment, and the röntgen-ray therapist should learn to recognize this change in rodent ulcers. Recurrence after röntgen cures has been noted.

¹ Johns Hopkins Hosp. Bull., Nov., 1903.

² Boston M. and S. Jour., Jan. 21, 1904.

A study of the **histologic changes taking place in epithelioma under the röntgen-ray treatment** is presented by J. Clark Stewart¹ (Minneapolis). The report is considered preliminary, and Stewart's conclusions are as follows: "(1) It is probable that when epitheliomas react favorably to röntgen-ray treatment, that characteristic histologic changes will be found. (2) The important early changes are fatty degeneration and vascularization of the epithelial pearls. (3) Leukocytic infiltration and various degeneration processes complete the destruction. (4) Bodies indistinguishable from 'Plimmer's bodies' multiply as epithelia degenerate."

D'Arcy Power² describes 4 cases of **carcinoma treated by injections of Otto Schmidt's serum**. These injections were done under the direction and advice of Harold Johnson, who contributed an article upon the advantage of this treatment in the *Lancet* for November 14, 1903. The cases were carefully selected as proper ones for the treatment, but in each the treatment was a failure. Power states that: "(1) In regard to the reaction, there is no doubt that a reaction takes place after the injection of Schmidt's serum. The temperature rises and with it the pulse, but the respirations, as a rule, are not affected. In this rise of temperature I see nothing peculiar, for it follows the injection of serum which admittedly contains toxins, and in all probability any similar serum would produce a similar result if it were active. It cannot therefore be said with accuracy that the reaction is specific, and this is proved by the fact that Case 1 showed the most typical reaction, yet subsequent examination of her tissues failed to detect any malignant disease. (2) The local effect upon the tumor was shown in each case, for the breast in the first case and the malignant masses in the other two cases became inflamed and reddened as the result of the injection. Yet, here, again, I could not satisfy myself that the serum acted by selection upon malignant tissues only. It seems to me to intensify any preëxisting inflammation. This was effectually shown in Case 1, where the lymphatic glands in the right axilla became enlarged in addition to those in the left armpit, the original seat of cancer being the left breast. For here, again, subsequent examination showed that none of the glands which had thus become enlarged after the injections of the culture were affected with cancer. (3) The treatment is certainly painful apart from the succession of hypodermatic injections." One of the cases shows clearly that malignant disease progresses even to a fatal issue while the injections are being given. It is Power's belief that the method is of no service from a prophylactic, diagnostic, or curative standpoint.

An editorial³ in the *Journal of the American Medical Association*, headed the **Empirical Methods of Treatment in Inoperable Cancer**, discusses the report of the Middlesex Hospital cancer wards. In this hospital an effort is made to determine the value of practically all the various cancer cures which are promulgated, provided always that their trial does not interfere with the comfort and health of the patient. Re-

¹ Jour. Am. Med. Assoc., July 18, 1903.

² Brit. Med. Jour. Feb. 6, 1904.

³ June 4, 1904.

garding the operation of oöphorectomy for carcinoma of the breast it has been found that the best results have been obtained in patients over 40 years of age and before the menopause, and when they are free from bone and visceral complications. The results obtained, however, in the cases in which this treatment was tried are not such as to offer any very great encouragement. Electric currents of high tension and rapid frequency produced little or no change in the local condition, but some improvement in the general tone of the patient. All the various remedies, such as the extract of violet leaves, molasses, etc., were also tried without results. Cancroin, in the use of which Adamkiewicz of Vienna claims such wonderful results, in the Middlesex cancer wards seems to have succeeded chiefly in causing much pain when injected and to have produced no beneficial results. The results from the use of thyroid and thymus extracts have also given no satisfaction. The röntgen rays have given by far the best results in these inoperable cases of cancer, particularly through their ability to clean up the ulcerating surfaces and to lessen the pain. The report states, however, that "the röntgen-ray treatment should never be attempted when an operation is possible," although it is also claimed that "in röntgen rays we have an agent which has perhaps done more for the relief of inoperable cancer than any method heretofore known."

H. W. Austin¹ reports a **unique case of neurofibromas of the skin and large nerve-trunks** in which there developed a **large spindle-celled sarcoma** beneath the body of the scapula. In this case fibroid tumors were found and removed from the musculospiral and long thoracic nerves. The patient was a sailor, 46 years of age. The duration of the condition was about 10 years. The tumors occupied every part of the body, ranging from the size of a pea to that of a large English walnut, and numbered several hundred. The patient applied for relief of pain situated in a large tumor on the musculospiral nerve. This growth was removed and also one over the long thoracic. After the patient's death it was demonstrated that there had been a recurrence of the growth in each situation. During his stay in the hospital there rapidly developed underneath the upper portion of the clavicle a large tumor which, upon removal, proved to be a large spindle-celled sarcoma. The growth was removed, but returned promptly, with metastasis in the lung and diaphragm, and the patient died. The röntgen rays were used freely upon these growths without effect. The claim of von Recklinghausen that these fibrous skin-tumors, molluscum fibrosum, are neurofibromas is considered by Austin to be true, and the occurrence of multiple fibroids of the large nerves in this case showed the same pathologic tendency in the nerve-trunks and in the nerve periphera. The rapid-growing malignant tumor may have originated in a neurofibroma of the subscapular nerve—that is, a small neurofibroma may have assumed a malignant form or undergone sarcomatous degeneration.

A case of **cutaneous neurofibromatosis** in which the newly formed nerve-fibers were found in the tumors is presented by Arthur Whitfield.² This condition was first thoroughly studied by von Recklinghausen,

¹ Med. Rec., Oct. 31, 1903.

² Lancet, Oct. 31, 1903.

who showed that molluscum fibrosum, false neuromas, and elephantiasis characterized by single large pendulous circumscribed or diffuse tumors of the limb were different phases of the same morbid state. To this condition has been given the name of "von Recklinghausen's disease." It is characterized by the presence of tumors on the nerves, tumors on the skin, and patches of pigmentation. All these conditions, however, are not found in every case. Whitfield's patient was a man 50 years of age who presented small soft tumors all over the scalp, face, and trunk, with a few on the right side of the tongue and beneath the mucous membrane lining the cheeks. A few also were found upon the extremities. It was not possible to trace any arrangement in the tumors suggesting their confinement to the course of certain nerves. The interesting point in this case is the fact that one of the tumors which was removed, when subjected to microscopic examination, showed fairly numerous nerve-fibers, usually rather widely separated from one another, as if by proliferation of the endoneurium and perineurium themselves. The point of great interest was that these nerve-fibers in most instances showed a very well-marked beading exactly similar to that described by Purves Stewart as characteristic of newly developed nerve-fibers, and this investigator, on seeing the sections, stated that the tumor was more than a simple overgrowth of nerve-sheaths and actually gave evidence of a true new-formation of nerve-fibers. Whitfield does not agree with Soldau that the ordinary skin nevi or moles richly supplied with nerve-fibrils should be classified as neurofibromas. He realizes that his contention regarding the newgrowth of nerve-fiber in these tumors must depend upon the accuracy of Purves Stewart's work and deductions.

Charles A. Morton¹ (Bristol) reports 2 cases of retroperitoneal cyst. One was a mesenteric cyst which presented all the evidences of an ovarian cyst. The second case was a most interesting one, being a large cyst connected with the head of the pancreas and causing obstructive jaundice by pressure on the common bile-duct. The patient was a man 34 years of age. He had intermittent jaundice without pain and a distinct fluctuating abdominal tumor could be felt a little to the right of the median line. The abdomen was opened and this tumor was drained. It was situated in the neighborhood of the head of the pancreas. Its contents contained albumin, but did not convert starch into sugar. The patient recovered and the fistula closed. Later there was a recurrence of the jaundice, which again assumed an intermittent type. It became, however, more persistent and the abdomen was opened a second time, when 2 cysts were encountered. These were also retroperitoneal cysts, but not connected with one another. Their contents converted starch into sugar. Morton does not think that they resulted from a refilling of the old cyst cavity. They were drained and the patient made a recovery which apparently is permanent. This case is interesting because of the rarity of obstructive jaundice from cysts of the pancreas. Out of 121 cases of pancreatic cyst Körte found jaundice present in only 9. The situation of these cysts also was unusual, most pancreatic cysts occurring on the

¹ Brit. Med. Jour., Nov. 28, 1903.

left side of the median line. Morton refers to the difficulty in differentiating adrenal cysts from pancreatic cysts. The varying character of the jaundice in the case reported is explained on the theory that it depended upon the tension of the cysts.

John Campbell¹ (Belfast) reports 2 cases of **subperitoneal lipomas**. The first occurred in a woman 55 years of age. The tumor weighed 21½ pounds and occupied the anterior abdominal wall between the peritoneum and the muscles. This growth had evidently undergone a malignant change, as there was a recurrence from which the patient died 16 months later. The second case reported occurred in a woman 50 years of age. The tumor was situated in the right broad ligament and iliac fossa. It was enucleated with comparative ease and the patient recovered. "Subperitoneal lipomas are more frequent in women than in men, in the proportion of 25 to 16. They occur most frequently on the right side, the neighborhood of the kidney and the iliac fossa being their favorite sites. Clinically there are two important varieties, both of which are exemplified by the cases above recorded—namely, the malignant and the benign. The former include the retroperitoneal tumors, especially those which originate on the posterior aspect of the abdomen. They are difficult or impossible to remove. They are microscopically sarcomas in whole or in part. Patients afflicted with them are at first in good health, but ultimately waste markedly, while the tumor rapidly increases in size."

Primrose² (Toronto) reports a case of **nævus lipomatodes** in a child 2 years of age. At birth there was an enlargement of the left side of the abdominal wall, and over it the skin was very thin. The enlargement of the thigh was hard and firm, and dark pigmented spots were visible on the surface. The mass has grown steadily since birth.

Keen³ reports a case of **enormous mixed tumor of the parotid region**. The accompanying illustration (Fig. 4) represents the size of the growth and the extent of its attachment. The patient was a man 49 years of age. He first noticed a small lump in the right parotid region in 1880. In 1892 it was the size of a large walnut. It grew gradually for a number of years, and during the last two years it has doubled its size. In 1903 there occurred a discharge of bloody fluid from the tumor, greatly reducing its size. It extended down to the clavicle and nearly to the median line at the back of the neck. It did not seem to be deeply attached to the larynx or any of the bones in its neighborhood. It was most firmly attached in the parotid region; it was quite movable, and the skin over it was movable except at the point of a discharging fistula. The growth was composed of nodular masses. It was removed without great difficulty and without injury of any of the important bloodvessels or nerves of the neck, in spite of the fact that it was very adherent to the vessels. A number of the branches of the facial, however, were unavoidably divided. A moderate amount of the parotid gland was also removed with the tumor. A culture taken from the discharge showed

¹ Brit. Med. Jour., Nov. 28, 1903.

² Canadian Jour. of Med. and Surg., April, 1904.

³ Jour. Am. Med. Assoc., April 30, 1904.

PLATE I.



Keen's case of enormous mixed tumor of the parotid region, three months after operation (Jour. of Amer. Med. Assoc., April 30, 1901).

staphylococci. The weight of the tumor when removed was 4½ pounds. It was examined by Coplin, who pronounced it a myxochondrolymph-angioendothelioma. Although no salivary gland structure was found in the sections studied, the specimen conformed in every particular to the mixed tumors which occasionally originate in those organs, particularly in the parotid. The second illustration (Plate I) represents the patient 3 months after operation. Keen states that this is the largest tumor of the neck he has ever operated upon.



Fig. 4.—Keen's case of enormous mixed tumor of the parotid region. Tumor seen from the front (*Jour. Am. Med. Assoc.*, Apr. 30, 1904).

Roberg¹ discusses the subject of **sialolithiasis** and reports an interesting case. Fütterer, in 1896, was able to collect 160 cases of this condition. Roberg has been able to add 47 other cases occurring since 1896. In his own case one stone was found in Wharton's duct and one in the submaxillary gland itself. The patient's history extended over nearly 30 years. In 1874 he first noticed a lump in the right submaxillary region when anything occurred to excite salivary secretion. The mass would remain from 30 minutes to 2 hours, disappearing gradually.

¹ *Ann. of Surg.*, May, 1904.

This condition continued for nearly 20 years, when the swelling remained present for 6 weeks and became large enough to reach the cutting-edge of the lower teeth. Fenger at that time removed a small stone from Wharton's duct. The patient was quite well after this until 1901, when a hard, painful swelling the size of a hickory-nut appeared in the right submaxillary region. An abscess formed and was drained at this time. The swelling did not entirely disappear, and a year later it had greatly increased in size and was very painful. Digital examination revealed a hard nodule the size of a large pea in the floor of the mouth opposite the second molar tooth. It was immovable and felt as though it were attached to the maxilla. At this time there was evidence of suppuration of the submaxillary gland with a cellulitis of the neck. A quantity of curdy pus was evacuated under local anesthesia, and a week later under general anesthesia a concretion the size of a split pea was removed from Wharton's duct and the submaxillary gland removed. A second calculus was found lodged in the beginning of the duct. Careful examinations of the saliva in this case showed in regard to solids and reaction that it was normal.

This condition occurs most often between the ages of 20 and 40 years. Burdel has reported the occurrence of a calculus in the sublingual duct in a child aged 3 weeks. Men are more frequently affected than women. The size of the calculus varies from that of a split pea to that of a date-stone. They occur usually singly. In the 47 cases collected by Roberg there was more than one calculus in 7 cases. Recurrence took place in a small percentage of the cases—5 out of the 47. Stones form most frequently in Wharton's duct and next in the submaxillary gland itself. Foreign bodies have been found in only a small percentage of the cases, although such objects as hair, particles of grass, etc., have been the nucleus of stone-formation. Galippe found bacteria in all calculi examined. Invariably the degree of alkalinity was increased and the acidity decreased. "If saliva is exposed to the air for a short time, CO_2 escapes, and a thin film forms on the surface, which on examination is found to be calcium carbonate. Hence the removal of CO_2 alone is sufficient to precipitate the calcium salts. When the bacteria decompose the proteids in the saliva, ammonia is produced, which probably immediately unites the CO_2 held in solution, and we promptly have the conditions favorable for calculus formation. From this it is reasonable to conclude that the bacteria cause a precipitation of the calcium salts of the saliva by increasing the alkalinity of the saliva and removing the CO_2 ." It is improbable that salivary cysts are an important etiologic factor, since these are rare in Wharton's duct, in which position calculi occur most frequently. Roberg believes that, in addition to bacteria, foreign bodies are an important contributing cause, and thus explains the frequency of calculi in Wharton's duct, which is large and so placed as to permit the entrance of particles of tartar and food. In only one case have calculi been found in more than one gland or duct in the same person.

Regarding the symptoms, it is stated that in the absence of suppura-

tion a calculus may exist for years without much disturbance. The most characteristic symptom is the so-called "salivary colic" characterized by intermittent retention of saliva and accompanied by more or less pain and discomfort. It occurs most frequently when the patient is eating and remains from one to several hours, the resulting tumor disappearing gradually. There is usually some difficulty in chewing, swallowing, and speaking. Examination of the floor of the mouth will usually detect the calculus. If not interfered with, there eventually develop a suppurative condition of the gland and a cellulitis of the neck. This may at times closely resemble Ludwig's angina. The abscess may be easily mistaken for an alveolar abscess if a good history is not obtained. A large percentage of the cases are diagnosticated malignant disease. In one case the calculus was detected by the use of the röntgen ray. The treatment consists in evacuation of the abscess, removal of the calculus, and in some instances the extirpation of the gland. When it is possible, calculi should be removed through the mouth, although they have been successfully removed from Stenson's duct from the outside, the duct having been sutured after the removal of the stone.

F. C. Wood¹ discusses at great length the **mixed tumors of the salivary glands**, including a report of a large number of cases, and reaches the following conclusions: "(1) There is a group of extremely complicated tumors occurring in the facial region which contain elements from both epiblast and mesoblast in most intimate relation to each other. (2) The complicated structure of the stroma, containing as it does elements such as embryonic connective tissue, cartilage, bone, fat, and lymphoid tissue, and very rarely striated muscle, is explained most easily by the assumption of an embryonic misplacement of mesoblast. (3) The structure of the parenchyma is so slightly characteristic in morphology that its epithelial nature in all cases can only be considered as probable; yet in about 24 % of the tumors examined the presence of epithelium is undoubted. The form and relationships of the cells of the parenchyma do not furnish sufficient data to justify these cells being regarded as of endothelial origin. (4) The theory of early embryonic displacement of epiblastic tissue during the process of formation of the parotid and submaxillary glands and the branchial arches may account for many of the morphologic peculiarities of the cells of these tumors, especially the lack of many typical features which we associate with epithelium. The same condition may be seen in the epithelial cells of the congenital moles, in which the epithelium is with difficulty distinguished from connective-tissue cells, owing to its close connection with the stroma of the tumors and its undifferentiated type. (5) The mixed tumors of the salivary glands run a clinical course strikingly different from sarcomas and carcinomas, in that they are slow-growing and generally benign. The regional lymph-nodes are not invaded, and recurrences are likely to remain local in a considerable proportion of the cases."

W. Moore,² in dealing with the **surgical aspect of hydatid disease**,

¹ Ann. of Surg., Jan. and Feb., 1904. ² Interecol. Med. Jour., July 20, 1903.

says that it should always be remembered that hydatid cysts may, indeed, that they frequently do, undergo a process of spontaneous cure, and that this fact practically accounts for the cures taking place in the hands of certain cancer quacks. Frequently from an unknown cause the cyst dies, the fluid is absorbed, and the membranous cyst contents are converted into a thick, pultaceous mass which remains quiet in the body. These inert masses are frequently encountered postmortem in the liver and other portions of the abdomen in persons who have never been suspected during life of harboring hydatids. Three methods of treating hydatid disease of the liver are discussed: First, that of a simple puncture, which is now practically abandoned. The method is not unattended by danger, even immediately; there may be times, however, when the method is justifiable. Lindemann's operation, which consists in drainage of the cyst through the abdominal wall, is now more universally practised than any other method. The drainage of the peritoneal cavity is almost never resorted to when this operation is performed. The operation of Bond, which consists in the thorough evacuation of the cyst contents, the cleansing of the cyst cavity, and closure of the opening without drainage, is one which Moore thinks has not been given the trial which it deserves. In suitable cases it is deemed the best treatment known for hydatid cysts of the liver. Unfortunately, there are many cases in which it is not applicable. It is suitable in all cases of monocyst which are so accessible that the contents can with certainty be fully removed. It is even applicable to cysts containing daughter cysts if sufficiently accessible for thorough cleansing. It is true that in a number of cysts treated in this way a reaccumulation will take place requiring secondary drainage, and therefore the incision in the cyst wall should be so made that when the wound in the abdominal wall is closed, the two shall be in apposition. The appearance of jaundice in hydatid disease of the liver generally indicates that a communication has been established between the cyst and the biliary passages and that a piece of mucous membrane is caught somewhere in the ducts. More rarely the condition is due to pressure of a cyst on the common duct. In such cases there is apt to develop a well-marked pyelephlebitis with multiple pyemic abscesses. It is thought that the infection in these cases probably travels from the intestines to the cysts by way of the bile-ducts. When the cyst is situated at the upper part of the liver, the incision should be made through the thorax, a portion of one or preferably portions of two ribs being removed to allow access to the cyst. When, however, the liver is greatly enlarged and reaches well below the ribs, operation through the abdomen is often better than through the chest. There is no objection in any case of doubt to the making of an abdominal exploration to discover the exact situation of the cyst, although it might then be determined that the cyst should be drained through the chest-wall.

In the case of multiple cysts within the abdominal cavity surgery has recently been able to accomplish something by repeated abdominal sections with the Bond method of treatment of as many cysts as seems

PLATE 2.



Pithoums of the tunica vaginalis (Ballcoch, in Ann. of Surg., March, 1904).

warranted at each operation. A period of 2 or 3 weeks should intervene between the operations. As a general rule, hydatids situated in the pelvis had best be treated through the abdominal wall. Occasionally, however, they may be evacuated through the vagina in the case of women who have had children.

The diagnosis of hydatid disease of the lung is difficult in the absence of rupture. The röntgen ray, however, offers a great help. When a diagnosis has been made with a fair degree of certainty, the surgeon may endeavor to locate the cyst with an exploring needle, the patient being anesthetized and ready for a more thorough treatment of the cyst. Drainage in such cases should be employed. The danger in cases of hydatid of the lung consists in the rupture of the cyst and suffocation; therefore during the process of operation and opening of the cyst the patient should be kept turned well over toward the affected side, to prevent the flow of blood into the air-passages.

When hydatids occur in the intermuscular planes, subcutaneous cellular tissue, etc., the cysts should be completely removed. When occurring in the spinal column, the disease is incurable. Hydatid disease of the long bones usually necessitates amputation, though occasionally when the disease is not extensive enucleation may be practicable. Moore refers to a case under his care of hydatid disease of the innominate bone in which removal was impossible and where the patient seems to be getting well after drainage and repeated irrigation with permanganate of potash solution, which has a solvent action on the hydatid membrane.

Hydatid disease of the brain and spinal column requires exposure, evacuation, and drainage.

Balloch¹ (Washington) reports a unique case of **fibromas of the tunica vaginalis**. The patient was a colored boy 16 years of age. His present trouble began 8 years previously with no history of injury. It first appeared as a swelling in the upper part of the right side of the scrotum and gradually enlarged. There was no pain, the only inconvenience being due to the size of the tumor. The scrotum reached nearly to the knees. Its veins were prominent. The right testicle was 8 inches below the external inguinal ring and was normal in size, shape, and consistence. The left testicle was 4 inches below the external ring and was also normal. There was no fluid in the scrotum. The scrotum presented a peculiar flabby, gelatinous feel. Three separate masses could be made out in the right side of the scrotum, one high up, near the ring, and the others below it. All were freely movable. These signs and the history of the case led to a diagnosis of a fibroid growth in the tunic. When the right scrotum was opened, the tunic was found greatly enlarged and thickened and was converted into a gelatinous mass. The upper tumor ran into the inguinal canal and was attached there by a pedicle. No distinct points of attachment could be discerned for the other two. They seemed to be embedded in the thickened tissues of the tunic. The three tumors, together with the gelatinous tunic, were removed

¹ Ann. of Surg., Mar., 1904.

(Plate 2). The right cord was accidentally cut, and it, together with the testicle, was also removed. A microscopic examination of the testicle later, however, showed that its removal was indicated. The patient made an uneventful recovery. The largest growth measured 5 by 3 inches and the other two 4 by 2½ inches. The weight of the entire mass was 58 ounces, the tumors alone weighing 38 ounces. The pathologist reported the tumors as soft fibromas undergoing myxomatous and fatty degeneration. The testicle also showed areas of myxomatous degeneration. Balloch states that this case illustrates the peculiar tendency to fibroid degeneration in the negro race. A thorough examination of the literature of this subject shows that this case is practically unique, only one other being found which resembled it. Balloch reaches the following conclusions: "(1) Like other serous cavities, the cavity of the tunica vaginalis may be the seat of fibrous growths. (2) Irritation is an important factor in their production. (3) They spring originally from the subserous connective tissue, but may become detached and lie loose in the cavity. (4) They are mostly of the variety known as soft fibroma. (5) They are prone to myxomatous and fatty degenerations. (6) The testicle may be affected by the same forms of degeneration. (7) The growths are generally minute, the present case being unique as to both the number and the size of the tumors. (8) Excision is the only effectual remedy. (9) As the testicle is liable to be affected, the propriety of removing it with the growths should be considered."

The accompanying illustrations (Plates 3 and 4) represent a case of **rhinophyma** reported by Keen.¹ The patient was a man 65 years old, and the condition had started 15 years previous. The growth had reached such proportions that it seriously interfered with the patient's eating, he being unable to take liquid food, such as soups, at all out of a spoon without lifting the nose upward. The condition was painless. There was a tendency to bleed after rubbing the face with a towel. The illustrations represent the extent of the disease and the result of the operation, which consisted in the excision of the central portion of the growth from the upper margin of the diseased area down to the tip of the nose by an elliptic incision. The edges of the resulting wound were then sutured. The pressure in suturing the tissues resulted in the squeezing out of considerable sebaceous material. As it was impossible to make a suitable ellipse in the alas of the nose, Keen merely shaved off all the hypertrophied tissue. The hemorrhage accompanying these procedures was not severe, no vessel requiring a ligature. One week after the first operation a little further paring of the alas of the nose was done, and about a month later a slight fissure which remained between the left ala and the tip of the nose was pared and sutured. The photographs (Plate 4) were taken about 2 months after the operation. Coplin, who examined the growth, presented the following diagnosis of it: "Soft fibroma of the skin with distention of the acini, and possibly a hyperplasia of sebaceous glands." Keen states that this is one of the most marked cases of *acne rosacea* terminating in a true rhinophyma which

¹ Ann. of Surg., May, 1904.

PLATE 3.



Keen's case of rhinophyma. Appearance of patient before operation (*Ann. of Surg.*, May, 1904).

PLATE 4.



Keen's case of rhinophyma. Appearance of patient after operation. The corrugated condition of the skin is more marked than on the nose itself (*Ann. of Surg.*, May, 1904).

he has ever seen. The fear of hemorrhage has deterred surgeons from operating upon these cases, but Keen's experience in the present case and that of von Bruns in other cases show that the fear is not well founded. When the entire skin is not removed and the edges sutured, but the skin shaved off, Keen recommends that this shaving should not go entirely through the skin, since if it does, considerable scar tissue results.

F. Bolton Carter¹ reports a case of **true teratoma of the neck**. The child, a female, was born at full term with a large multilocular semicystic tumor about the size of a cocoanut occupying the whole front of the neck. It caused no trouble during parturition. The child lived but one month. The hyoid bone was partly included in the mass.

A discussion of **tumors of the retrocarotid gland** is presented by Reclus and Chevassu,² who also give the details of a case coming under their care. This gland is situated at the bifurcation of the common carotid. Tumors occur here in early life, the cases reported being between the seventeenth and the thirty-third year. The cause of the tumors is unknown, and they have been made up, in the few cases which have been reported, of bloodvessels and numerous cells of undetermined origin, the whole being inclosed in a capsule. The growth is slow and the first evidence of it is the discovery of a growth by the patient; occasionally slight pain in the neighborhood first calls attention to it. When the head is extended, the outline of the tumor is more prominent, and at such times it may be seen to pulsate. It varies in size from a pigeon's to a hen's egg. It is generally soft and elastic and quite mobile transversely. A systolic murmur may be heard upon a scultation. The pulsation is the most striking symptom, this being synchronous with the radial pulse, nonexpansile, and disappearing with compression of the common carotid. The authors state that a positive diagnosis of tumor of the retrocarotid gland may be made in the presence of a single soft pulsating, nonexpansile tumor of slow development in the carotid region at the level of and above the thyroid cartilage. Treatment is surgical, consisting in extirpation of the tumor.

Under the head of **india-rubber jaw**, J. Burton Cleland³ (Sydney) describes a peculiar carcinomatous invasion of the mandible from the submaxillary salivary gland. He presents a photograph of the jaw after removal and reproductions of sections. The patient was a man 55 years of age, who first noticed that his teeth were becoming loose 5 months before admission to the hospital. Three weeks before admission he noticed for the first time a mass just below the middle of the lower jaw. His jaw-bone seemed broken at the symphysis and the two halves could be readily moved on each other. Behind the symphysis and extending along the inner side of the jaw for about 1 inch on the right and 2 inches on the left side was a hard, smooth mass firmly attached to the bone. There was no glandular involvement on either side of the neck. The jaw, except the rami, was removed by Dr. MacCormick. Macroscop-

¹ Lancet, Nov. 28, 1903.

² Brit. Med. Jour., Dec. 19, 1903.

³ Rev. de Chir., Sept., 1903.

ically no bony tissue could be found in the jaw, the original structure being replaced by a dense, whitish neoplasm showing minute blood-stained streaks which could readily be cut with a knife, yielding a creaking sensation. The teeth were quite perfect and embedded in this new tissue. There was an irregular line of demarcation at the angle of the jaw where the healthy bone joined the diseased portion. The growth is supposed to have had its origin in the submaxillary gland. An interesting point in the case was the good general health of the patient before operation and for at least a year afterward, when no recurrence had taken place. The jaw was so elastic that it could be bent considerably and would spring back upon removal of the pressure. The preservation of the teeth is considered extremely remarkable.

Charles L. Scudder¹ presents a study of 15 cases of **sarcoma of the long bones** operated upon at the Massachusetts General Hospital, and a brief history of each is given. The cases were in nowise selected. The following is a brief summary of the operations and the results: "There were 6 amputations at the shoulder-joint for sarcoma of the humerus. There was no reply from one case. There was recurrence in the axilla in one case. There was one case of giant-cell sarcoma, in apparent health 3 years and 4 months after the operation. There were metastases in the lungs in 2 cases and probably in a third. There were 4 amputations of the thigh for sarcoma of the tibia. One giant-cell sarcoma, in good health 6 years after the operation. One lived 2 years and 5 months and was drowned. One is living 3 years and 6 months, in good health. One died of metastasis in the lungs. There was one amputation at the hip-joint for disease in the lower end of the femur. This patient died 13 months after the operation. There were two resections,—one of the tibia, one of the ulna,—each a case of giant-cell sarcoma. Each is at present well—one 3 years and 2 months after the operation and the other also 3 years and 2 months after the operation. There was one partial operation upon the tibia. This case is in fair health 5 years after the operation, although a probable recurrence is present in the leg; there was one amputation above the elbow in perfect health 15 years later." There is undoubtedly a difference in the malignancy of the sarcomas of the bones; the giant-celled sarcoma being less malignant than the round and spindle-celled type. This fact brings up the question as to whether the less malignant cases should receive the same radical treatment that is applied to the more malignant ones. From a study of these cases and from others which have been reported Scudder believes that "if the giant-cell sarcoma of a long bone is limited to the bone and is localized in the bone, involving only a small area, a resection or partial operation is justifiable, *vide* Greenough's case; but if the soft parts are in any way involved, or the disease in the bone is extensive and of long duration, that then an amputation is the best treatment; an amputation in the continuity of the bone, if the lower end of the diaphysis is involved, or an amputation at the joint above the disease, if the disease is high in the shaft. Exarticulation at the joint above the disease, at the shoulder or at the hip, is indicated only in those cases in which the dis-

¹ Boston M. and S. Jour., June 2, 1904.

ease cannot otherwise be completely removed. I should limit the excision or partial operation to a considerably narrower class than it is limited by Bloodgood. It is true that it has been pointed out that local recurrences after the conservative treatment can be satisfactorily handled. There appears also to be no increase in the likelihood of metastasis following local recurrence. A careful study of the evidence presented does not, however, make me enthusiastic for the employment of the partial operation, except in the most carefully selected cases. It is always to be kept in mind that metastasis may exist, and in the large proportion of late cases coming to the hospital clinic do already exist in the lung, only to make themselves known some time after operation. Exploratory incision for diagnostic purposes in this group of cases is to be avoided. It is possible that metastases have been occasioned by these exploratory incisions. The röntgen ray is of great value in diagnosis, particularly early in the development of the disease, and in those cases in which no positive diagnosis has been made."

[It seems worth while to insert this table of cases (p. 46) that have been traced after operation. For further discussion on sarcoma of femur see the section on Amputation.]

After a study of a number of late results of **röntgen-ray treatment of sarcoma**, Wm. B. Coley¹ is not inclined to look with favor upon the ultimate effects of this method of treatment. Since February, 1902, Coley has observed 103 cases of malignant tumors treated with the röntgen ray—30 recurrent carcinomas of the breast, 42 sarcomas in various localities, 28 cancers of the face, head, and neck, and 3 miscellaneous. Brief histories of a number of cases showing the general tendency to late recurrence after apparent cures with the röntgen ray are presented. The following are Coley's conclusions: "(1) The use of röntgen ray in cancer should be limited to recurrent and inoperable cases, with the sole exception of small superficial epithelioma of the face. Even here, I believe, the results of excision will prove to be better and more lasting, save in the proximity of the eyelids and nostrils. (2) It is most misleading to report as cures cases in which malignant tumors have merely disappeared under the influence of the röntgen ray, since speedy return is the rule rather than the exception. (3) At the present moment there is no evidence to prove that any permanent cures have been obtained, save possibly in the case of rodent ulcer."

Keenan² (Montreal) reports a case of **sarcoma of the tongue** and presents an analysis of the previously reported cases. The case reported is that of a man 47 years of age who was admitted to the hospital because of a small tumor far back on the dorsum of the tongue. This was noticed 3 months before admission. The growth was a firm, globular tumor about 1.5 cm. in diameter, situated on the right side of the dorsum of the tongue, between the pillars of the fauces. It had a broad base, extended down into the tissues of the tongue, and projected well above the level of the surrounding tissues. The epithelium over it was intact. The mass interfered somewhat with swallowing, but did not limit the

¹ Med. News, Feb. 6, 1904.

² Ann. of Surg., June, 1904.

SARCOMA OF THE LONG BONES. MASSACHUSETTS GENERAL HOSPITAL CASES.

| CASE. | AGE. | OPERATING SURGEON. | SEX. | REGION. | KNOWN DURATION OF GROWTH. | PATHOLOGIC REPORT. | OPERATION DONE. | IMMEDIATE RESULT. | REMOTE RESULT. |
|-------------------|------|--------------------|------|----------------------|---------------------------|----------------------------------|---|-------------------|--|
| 1. R. B. | 59 | S. J. Mixter | F. | Humerus, upper third | 4 mos. | Myelogenous round-celled sarcoma | Amp't. at shoulder-joint | Recovery | 3 yrs. 4 mos., rheumatism, otherwise fair health. |
| 2. L. T. | 16 | W. M. Conant | F. | Tibia | 2 mos. | Giant-celled sarcoma | Resection | Recovery | 3 yrs. 2 mos., good health, no recurrence. |
| 3. M. C. | 24 | R. B. Greenough | F. | Ulna, lower end | 3 mos. | Giant-celled sarcoma | Resection | Recovery | 3 yrs. 2 mos., no recurrence. |
| 4. R. O. | 24 | S. J. Mixter | M. | Tibia | 13 mos. | Giant-celled sarcoma | Amp't. thigh | Recovery | 6 yrs. 3 mos., good health. |
| 5. C. D. S. | 33 | C. B. Porter | M. | Radius, forearm | 1 mo. | Giant-celled sarcoma | Partial operation, amp't. above elbow | Recovery | 15 yrs., perfect health. |
| 6. J. C. | 19 | J. C. Warren | M. | Femur, lower end | 3 mos. | Round-celled sarcoma | Amp't. at the hip-joint | Recovery | Died about 13 mos. Lung metastases. |
| 7. R. L. T. | 15 | John Homans | M. | Tibia | 3 mos. | Round-celled sarcoma | Amp't. thigh | Recovery | 2 yrs. 5 mos., good health. Drowned. |
| 8. J. D. | 33 | F. B. Harrington | M. | Tibia | 36 mos. | Spindle-celled sarcoma | Amp't. thigh | Recovery | 1 yr. 3 mos., died, metastases. |
| 9. K. M. | 26 | A. T. Cabot | F. | Tibia | 6 mos. | Round-celled sarcoma | Amp't. thigh | Recovery | 3 yrs. 6 mos., good health. |
| 10. M. B. | 50 | J. W. Elliot | M. | Tibia | 18 mos. | Osteoid sarcoma | Partial operation | Recovery | After 5 yrs. 3 mos., health poor; local trouble at operation site. No reply. |
| 11. L. S. | 16 | J. C. Warren | M. | Middle humerus | 12 mos. | Large, round-celled sarcoma | Amp't. at shoulder-joint | Recovery | Recurrence axillary in 10 mos. |
| 12. J. I. C. | 33 | H. H. A. Beach | M. | Humerus | 3 mos. | Sarcoma | Amp't. at shoulder-joint | Recovery | 2 yrs. 4 mos., died, metastases in lungs. |
| 13. C. O. | 38 | F. B. Harrington | F. | Humerus, upper third | 16 mos. | Fibrosarcoma | Amp't. at shoulder-joint | Recovery | Autopsy; metastases in lungs. |
| 14. A. L. | 15 | C. B. Porter | M. | Humerus, upper third | 24 mos. | Round-celled sarcoma | Amp't. at shoulder-joint | Died | |
| 15. T. A. P. | 67 | J. W. Elliot | F. | Forearm | 6 mos. | Osteosarcoma | Amp't. upper arm, amp't. shoulder-joint | Recovery | 4 yrs. after last operation died of acute pneumonia. |

projection of the tongue. There were no enlarged glands. Two separate pieces of the growth were removed and submitted to microscopic examination, and the diagnosis was that of small, round-celled sarcoma. The patient declined to submit to the operation which was suggested and went to another hospital. Because of the portions which had been excised the nature of the growth was not realized and a local excision was done. Later there developed extensive metastasis in the abdomen, from which the patient died. The reported cases of sarcoma of the tongue Keenan divides into two groups, the pedunculate and the interstitial. In discussing the interstitial group it is shown that they were all round-celled sarcomas; that they occurred in middle life, the majority of patients being between the ages of 40 and 50; that extensive metastasis in the neighborhood were the exception rather than the rule; and that as a body they differed from the ordinary round-celled sarcoma in their relatively slow growth. Though local recurrence may take place, in several of the cases it was wanting. One of the signs which distinguish sarcoma from carcinoma is the fact that the epithelium usually remains intact and ulcerates only after a long period in the former condition. A therapeutic test differentiates sarcoma from gumma, a differential diagnosis which is often made with difficulty by the microscope. Keenan calls attention to the different interpretations placed by surgeons in America, Germany, and England on the term "lymphosarcoma," and thinks it would be better if this term were wholly done away with until an absolutely histologic differentiation is afforded, or, with the Germans, to apply the term only to cases in which there can be no question of the growth having originated in true lymphoid tissue. The treatment of sarcoma of the tongue must consist in wide excision of the tumor. Notwithstanding the great tendency to recurrence, the results of the cases here tabulated seem to justify operation.

Under the title of **operative possibilities in cases of advanced carcinoma of the breast**, L. S. Pilcher¹ discusses the present status of the operative treatment of this condition. He presents a review of 50 personal cases occurring between the years 1888 and 1900. A study of these cases goes to show very clearly that in order to be successful the operative treatment of carcinoma of the breast should be instituted at an early period in the disease and be most radical in the removal of surrounding tissue and glands. Pilcher's experience causes him to believe that nothing is more illusive than the apparent local extent of a carcinomatous process. Little importance can be attached to the subjective symptoms in these cases, since in many instances they are entirely absent until the disease is very far advanced. On the other hand, the size of the local growth and the rapidity with which its bulk has increased since its presence was detected, and the tendency to breaking down which it may exhibit when it comes to the surgeon's notice, are no positive index to the number and distance of the secondary outlying deposits which have occurred along the outgoing lymphatic paths. He is almost ready to conclude that clinically the surgeon never sees carcinoma of the breast in any

¹ Ann. of Surg., Sept., 1903.

other than an advanced state. "It cannot be too strongly emphasized that practically every case of carcinoma of the breast, when it has reached that degree of development by which a palpable tumor is formed, is already in an advanced stage, such an advanced stage that, as a rule, metastatic deposits have already begun to be formed."

G. Ernest Herman¹ reports the termination in a case of **recurrent cancer of the breast treated by oöphorectomy**. The breast was removed in October, 1890; in 1896 there was an inoperable recurrence; in March, 1897, the ovaries were removed. In September of that year none of the recurrent growth could be felt and the patient remained in good health until the autumn of 1901. She then began to develop symptoms of extensive metastasis, and on June 3, 1902, she died. The result of the operation in this case was that the patient had 4½ years of good health. Boyd is quoted as stating that about one-third of the patients who submit to oöphorectomy for inoperable cancer of the breast show more or less marked benefit, and in this condition Herman believes the operation should be recommended to the patient.

Charles R. Keyser² discusses **carcinoma of the male breast** and reports 5 cases. Keyser believes that the disease runs a slightly different course in the male and in the female. In the first place, he believes the disease occurs later in the male. In the female the left breast is the one most usually affected, and in the male, the right. The disease is not so rapidly fatal in the male as in the female. In the male ulceration is frequent and the disease usually starts in or about the nipple.

Robert Abbe³ discusses the **differential diagnosis of mammary cysts and their treatment**. Attention is particularly called to the fact that mammary cysts are probably more frequent than is nowadays supposed, and that they are too frequently subjected to radical treatment. Among his private patients only during the past 8 years Abbe has seen 41 cases of mammary cysts and 56 cases of hard tumors, besides a number of innocent inflammatory adenomas. In these cases he has made careful notes regarding the exact location of the tumor, and states that while cysts may be localized in any part of the gland with a slight predominance only in the upper and outer segment, the scirrhus tumors are almost universally distributed between the nipple and the axilla. In speaking of hard tumors he excludes adenomas and small sarcomas, as well as mammary induration following old abscess change. Of the 41 cases of mammary cysts, three-fourths of them were single cysts and in one-fourth 2 or 3, or even 4, were found. Out of the 41 patients, 33 were between 40 and 50 years of age; the others were over 35, except in two instances. The contents of the cysts varied in quantity from one dram to one ounce. The cyst-wall in these cases is usually so attenuated as to be imperceptible on palpation when the cyst is emptied. The gross characteristics of these tumors are a hard tumor in any section of the gland, usually placed rather deeply, never dimpling the skin

¹ Lancet, Jan. 16, 1904.

² Med. Rec., Aug. 15, 1903

³ Lancet, Feb. 28, 1904.

like a scirrhus or drawing on the nipple; sometimes nearly a flat ovoid; and in the majority of cases not giving a distinct sense of fluctuation on palpation. Particular attention is drawn to the deceptive hardness, rendering it impossible in many instances to detect the cystic nature of the tumor without the use of the aspirating needle. Abbe does not approve of the radical method of treating these cysts of the breast which has recently come into vogue, but strongly recommends their evacuation with the aspirating needle, by which means he claims that they can be absolutely cured. In only 2 instances of the 41 cases mentioned has the cyst refilled; in these a secondary aspiration resulted in a cure.

McGraw¹ (Detroit), under the title of **some practical considerations on the tumefactions of the climacteric breast**, reports a change in his attitude regarding the radical treatment of tumors occurring in the breast of women beyond the age of 30, his clinical experience having shown him that malignancy is not nearly so frequent as at one time he believed and taught. The occurrence of benign swellings in the female breast even in the climacteric period is much more common than is usually supposed. McGraw believes that it is this fact which has enabled the cancer quacks to cure some cases of breast tumors; the destruction wrought by their remedies in benign tumors, however, is illustrated by the report of several cases. McGraw says: "If I were to judge from my own experience, I should say that cysts of one kind or another, not including cystic sarcoma or those arising from the disintegration of cancerous or other tumors, are the most common of all tumefactions of the breast." The diagnosis of these cystic formations can be easily elicited by the employment of the exploring needle, and many of the cases may be cured by its use. The occurrence of fluctuation in these cases will depend upon the greater or less fluidity of their contents, and sometimes upon their location. More common than the milky cysts are the so-called involution cysts, which give rise more often than any other forms of tumefaction to diagnostic and prognostic errors. As a rule, they feel much more like solid than like cystic tumors, and are often irregular in outline. When all the tumefaction disappears after evacuation with the needle, it is the rule that the trouble will entirely disappear with a few punctures. McGraw had, however, seen one or two cases in which cysts with this history have been the forerunners of cancer. Occasionally an inflamed tumor of chronic character will develop in the location of a cured cyst, and this should always be remembered. "When the evacuation of the cyst contents does not cause an entire disappearance of the swelling; when it leaves behind a perceptible thickening or an induration, we have to deal with pathologic conditions which will cause more anxiety and trouble. The remaining tumefaction may be due either to an inflammation of the wall of the duct or of the outlying connective tissue, or to the presence of a neoplasm, which complicates, if it has not actually caused, the development of the cyst. A microscopic examination of the exuded fluid may or may not throw light on the nature of the malady. If inflammatory, it may possi-

¹ Amer. Med., July 25, 1903.

bly subside under massage and pressure; if neoplastic, it demands imperatively operative relief. McGraw does not think that the surgeon should delay action very long in these cases if treatment produces no benefit. It is then a proper case for exploratory incision, thorough examination, and radical measures." When the use of the exploring needle proves unsatisfactory, before resorting to the radical operation an exploratory incision should be made; and if doubt then still exists, the radical operation should be postponed until the microscopic examination has decided the question. "Certain inflammatory tumors can with difficulty be distinguished from scirrhus by microscopic examination. In fact, their clinical symptoms are of more value in diagnosis than the minute structure. They are all marked by a uniform eaking of the whole breast, so that the gland has a feel of even hardness. The skin, however, is not adherent, nor the nipple retracted, nor the axillary glands swollen, but the new inflammatory tissue surrounding the ducts and acini will strangle them, leaving here and there islands of epithelial cells. Sometimes a portion only of the mammary gland is involved, and the diagnosis may become difficult."

Herbert Snow¹ recommends the **removal of cystic tumors of the breast by forcible massage** and reports 10 cases in which this treatment is said to have been successful. The cysts result from the secretion of milk which is retained in the ducts, and it is as frequent in single women as in those who have borne children. The fluid is yellow, black or greenish-black in color, sebaceous in consistence, and can during anesthesia be expressed from the nipple, but to accomplish this some force is required. If the secretion is not liberated early, cysts in the parenchyma of the gland develop. In practically every case both breasts are involved in the process. Usually there is one large cyst and numerous smaller ones. Rupture of the cyst is not followed by any subsequent trouble, and it is stated that rupture can be easily produced. After rupture vigorous massage of the breast to force the fluid out through the nipple is then practised. It is said that the patients do not suffer subsequent pain and suppuration does not take place. Some soreness of the gland is noticed for a day or two. So far as Snow's present experience goes, the results are permanent. The majority of the patients treated in this way were between 40 and 50 years of age. One, however, was 76. One of the cases has gone 18 months and the others for shorter periods without development of further symptoms. Involvement of both breasts is so frequent that Snow now always practises massage of the apparently healthy breast.

This paper was discussed by Bentham Robinson, who doubts the advisability of the treatment and also the ability of the surgeon to rupture deep-seated cysts in the way described by Snow. [We are rather inclined to believe with Robinson that this treatment may be dangerous, and would certainly not advise it until the diagnosis has been confirmed by exploratory puncture, and this in itself, according to Abbe and McGraw, is curative.]

¹ Brit. Med. Jour., Oct. 17, 1903.

A. G. Ellis¹ reports the **pathologic findings in a case of cystic degeneration of the mamma showing transformation into scirrhus carcinoma.** The breast was removed from a woman 63 years of age by Keen. The specimen shows the transformation very clearly and is presented as an evidence in favor of the strong probability of malignant transformation occurring in cases of cystic degeneration of the female breast. A study of a number of cases of cystic involution and of carcinoma of the mamma has caused Ellis to believe that there is an intimate relationship between the two conditions, and he thinks that cystic involution may be, and perhaps is, followed by carcinomatous change. The present specimen shows direct extension into the surrounding tissue of the epithelium lining the cyst. The attitude of various authorities both pro and con. in relation to this subject is presented.

The following three questions are asked regarding the **relation of certain adenocarcinomas to atrophic scirrhus of the breast** by J. Clark Stewart²: "(1) Is there a distinctive tumor of the breast properly described by the name atrophic or atrophying scirrhus? (2) Is operative procedure for relief of such tumors to be advised against, because experience has shown that such an operation quite uniformly fails to prevent recurrence and thus shortens life, as recurrences are much more malignant than the original growth? (3) Can these tumors be morphologically distinguished from other malignant tumors of the breast and do their microscopic characteristics explain their slighter malignancy?" His conclusions regarding the answers to the questions are summarized as follows: "(1) The term atrophic scirrhus is worthy of retention as describing an important clinical entity. (2) It is extremely doubtful whether such cases are benefited by operation. (3) Certain adenocarcinomas of the breast have the clinical history of the atrophic scirrhus. (4) It seems probable that if more of these tumors were studied histologically they might prove to have an adenomatous element to justify their comparative benignancy."

ANESTHETICS.

The **various methods of employing local anesthesia** are dealt with by F. Gregory Connell.³ He does not think that the freezing mixtures are of much benefit in relieving pain in the opening of abscesses, etc., and certainly of no use when dissection is required. The toxic effect of cocain, which interfered largely with its use a few years ago, is now avoided by substituting eucain B or using very weak solutions of cocain. Constriction of the part and the addition of adrenalin chlorid also are of value in this respect. In a series of 50 cases in which cocain was employed Connell observed toxic effects in 3 instances. In a series of 80 cases in which eucain B was employed no such symptoms developed. Reclus has done 7000 operations with cocain anesthesia and has never had a death which could be attributed to the drug. This authority

¹ Ann. of Surg., Sept., 1903.

² Am. Jour. Med. Sci., Sept., 1903.

³ Ann. of Surg., Dec., 1903.

lays down the following rules: "(1) Never use a stronger solution than 0.5 % or 1 %. (2) Always have the patient recline during the administration of the anesthetic, and not get up for half an hour after the operation is completed. (3) Always have the patient eat or drink something before arising." The objection made by some that cocain solutions cannot be sterilized is contradicted by other authorities (Matas, Cushing), but it is certain that eucain B is not hurt by boiling. The administration of $\frac{1}{4}$ grain morphin, 15 to 30 minutes before producing the infiltration is now universally practised. It is especially indicated in all major and long operations and in infants and pemented patients. In the case of very nervous patients or when a limited amount of a general anesthetic is desired, the previous injection of morphin and the infiltration of the operation area with cocain solution are highly recommended. Regional anesthesia, produced by the injection of cocain solution directly into the nerve-trunks supplying the area of operation, is indicated in those instances in which the infiltration method is not applicable and in which a general anesthesia is contraindicated. In enumerating the various operations in which he has employed local anesthesia Connell refers to one case of inguinal hernia in which he operated upon both sides at the same time, by the same method and with the same solution, and on one side there developed a sloughing of a portion of the skin. The wound upon the opposite side healed without any complication whatever. In this case there was nothing to point to the infiltration as the cause of the sloughing. In this instance operation with a general anesthetic was absolutely contraindicated. The advantages to be derived from local anesthesia are enumerated as follows: "(1) Removal of the danger of death on the table. (2) Avoidance of the after-effects of general anesthesia on the heart, liver, kidney, and lung; but postoperative pneumonia seems to occur about as frequently after one anesthesia as the other. (3) No period of postoperative nausea, vomiting, or unconsciousness. (4) No danger of patient being drowned in fecal vomitus. (5) Patient, being conscious, is able to assist the operator in various ways. (6) Reducing by one the number of assistants; although it will be found to be convenient to have an assistant at the head of the patient to encourage and reassure him, and to be ready to administer a whiff or two of chloroform, if necessary." Connell closes with the following quotation from von Mikulicz: "The question of to-day is *not* which is the safer anesthetic, chloroform or ether, but in what cases can local anesthesia be substituted for anesthesia by inhalation." [Every year we do more operations with the aid of local anesthesia. When we first use it, we frequently conduct the process imperfectly and obtain unsatisfactory results, but as we gain in skill by practice, we become more and more able to render an area thoroughly anesthetic.]

Braun¹ discusses the use of adrenalin as a valuable addition to local anesthetic mixtures. Caution is recommended in regard to two points, viz., the toxic effects and secondary hemorrhage. The intensification of the anesthetic properties of cocain and eucain can be pro-

¹ Cent. f. Chir.; Med. Rec., Dec. 12, 1903.

duced to the full by amounts so minute as to be absolutely harmless, while larger quantities are undesirable through their tendency to permit secondary hemorrhage. "Contrary to general belief, adrenalin does not cause a secondary relaxation of the vessel-walls, leading to oozing, but, owing to its intense styptic action in larger quantities, even arteries are kept from bleeding, and hence allowed to go without ligature. When the effect of the drug wears off, the open vessels bleed, not because of any fault of the adrenalin, but because they were not secured. In minute amounts the anesthesia is greatly enhanced, parenchymatous oozing entirely checked, but all vessels of any importance still bleed and may be ligated as usual. The solution used by Braun for Schleich's infiltrations contains 0.1 % cocain with 2 to 5 drops of adrenalin chlorid 1 : 1000 to each 100 cc." [We are certain that adrenalin increases the efficiency and lessens the danger of cocain.]

A composition of adrenalin and cocain in infiltration anesthesia is also highly commended by Gangitans.¹ Nine parts of a 0.5 % or 1 % cocain solution is combined with one part of a 1 : 1000 adrenalin solution. About 7 or 8 minutes should be allowed to elapse after the injection before beginning the operation. A brief report is made of 100 cases in which Gangitans has used this composition. Of these operations, 31 were for hernia.

A. E. J. Barker² offers some clinical remarks on some **improvements upon the method of local analgesia**. He is a strong advocate of the use of eucain B instead of cocain, and has lately combined adrenalin with eucain B with the most satisfactory results. He urges that any one undertaking the employment of local anesthesia should thoroughly familiarize himself with the technic and with the anatomy of the part to be anesthetized, especially of the sensory nerve-trunks. The great advantage of combining the adrenalin with the eucain is that the former agent retards and diminishes the circulation of the blood in the part infiltrated, and consequently greatly enhances the analgesic properties of the latter agent. About 20 minutes should be allowed for the establishment of complete analgesia, and at the expiration of this time the injected field should be blanched; and if this has not taken place, then the adrenalin has been defective. Barker prepares his solution as follows: "Powders of β -eucain and pure sodium chlorid sufficient to make 100 cc. (3½ ounces) of the solution are kept in thick glazed paper ready for use. The amounts in each of them are β -eucain 0.2 gram (3 grains) and pure sodium chlorid 0.8 gram (12 grains). There is measured off 100 cc. of boiling distilled water, and to this the contents of one of the papers are added and then 1 cc. of Parke, Davis & Co.'s solution of adrenalin chlorid when the fluid is cool. As the adrenalin preparation is of the strength of 1 : 1000 we now have 100 cc. of normal saline solution with 2 : 1000 β -eucain and 1 : 100,000 of adrenalin chlorid in it—i. e., distilled water, 100 grams; pure sodium chlorid, 0.8 gram; β -eucain, 0.2 gram; and adrenalin chlorid, 0.001 gram." He finds that from 15 to 18 drops of the solution of adrenalin corresponds to 1 cc. Before using

¹ *Riforma Medica*, Sept. 9, 1903.

² *Lancet*, July 25, 1903.

any bottle of solution of adrenalin it should be held up to the light in order to see that it is clear and free from precipitate. The technic of the injection is illustrated by the description of its employment for a hernia operation. "The hernia is first reduced and the index-finger is thrust with the skin into the external ring as far as possible. Along this finger the needle is entered and the inguinal canal is filled with 10 cc. of the solution, an endeavor being made to inject it all around the neck of the sac, so as to reach at one spot or other the genital branch of the genitocrural nerve. The needle is then entered at the external end of the line of incision in the skin, and is made to infiltrate the *superficial* layers of the latter down to the root of the scrotum, making the resulting wheal at least an inch longer at each end than the incision is to be. Again, the needle is entered about $\frac{1}{2}$ an inch to the inside of the anterior superior spine of the ilium and pressure on the piston is at once begun slowly as it is thrust toward the ilioinguinal nerve to the depth of about one inch in moderately fat patients. The needle should then be partly withdrawn and be thrust in different directions toward the usual course of the nerve-trunk until the whole 10 cc. has been used up. The same maneuver is repeated at a point about one inch above the middle of Poupart's ligament, where the iliohypogastric nerve is most conveniently met. Then the leg is raised and another syringe-ful is injected along the ramus of the pubis and the root of the scrotum or labium. Thus about 50 cc. of the solution has been used up, equaling $1\frac{1}{2}$ grains of β -eucain and 0.5 milligram of adrenalin chlorid." At the expiration of 20 minutes the field of operation will be found insensitive to pricks, though not to touch; in other words, there is analgesia but not anesthesia. In all cases much can be accomplished by distracting the patient's attention during the performance of the operation, and Barker states that it is often well to let the patient sip a cup of tea while the operation is being performed. In one case his patient smoked a pipe and drank a cup of tea. A hypodermatic of morphin before the infiltration is of great advantage in calming the patient. [In our experience with cocain there have been so many cases in which toxic symptoms arose that we have practically abandoned it for eucain B, except in Schleich's fluid.]

Erdman¹ (New York) describes a **modified Allis inhaler** which is shown in the accompanying illustration (Fig. 5). Its advantages are that: "(1) The inhaler can be used in either the vertical or a side position of the head. (2) The inhaler can quickly be converted into either an open or a closed form. (3) The inhaler is adapted equally well for the exhibition of ether, the solutions on the Schleich principle, and for the more fugacious agents. Since the foregoing was written it has seemed feasible to modify the inhaler further so as to permit the use of both oxygen and nitrous oxid gas. For the former it was necessary only to make the knob on the upper plate patulous: the tube from an oxygen tank can easily be slipped over the knob at any time in the course of the administration, and as much oxygen be given as is desired. But this simple method is not sufficiently efficient for the economic use of nitrous

¹ Med. Rec., Jan. 23, 1904.

oxid. However, Erdman hopes to be able shortly to perfect this feature also, and to present an inhaler which, by slight manipulations, is adapted for all anesthetic agents."

Emil King¹ reports 2 cases of **resuscitation after apparent death from chloroform anesthesia**, and after discussing this question generally, reaches the following conclusions: "(1) Deep anesthesia is always a condition of danger. Therefore every precaution must be taken to guard against danger. (2) When serious accident occurs, we must have ready a well-matured plan of treatment which meets the indication in the best possible manner. (3) Death usually resulting from failure of the vital centers, the first indication is their stimulation. Artificial respiration, tongue traction, and heart compression should be first tried. The application of cold, ether being poured on the abdomen according to Hare, inversion, suspension and succussion, dilation of the sphincter ani, and electricity are worthy of trial if the others fail. (4) Hypodermatic injections during the stage of collapse are a waste of time. The arterial pressure being *nil*, there can be no effect from medication unless the injection be into the heart. They may do good before cardiac arrest or after the contractions are resumed, and then the remedies of value are limited to a few. (5) Injections of ether and alcohol in any form are apt to be harmful. Their effect in overdose is so similar to chloroform in their action on the vital centers that we only add to the danger by their use. (6) Mechanic efforts at resuscitation must not be so rough that internal organs are injured. That this is possible is proved by reported cases where the liver was torn, blood found in the pleura, and the tongue wounded. (7) Since we cannot know when the molecular changes separating true from seeming death take place, our efforts at resuscitation should continue for at least one hour."

A **death from chloroform** is reported by Galloway² (Chicago). The patient was a boy 7 years of age who was to be operated upon for a deformity of the face. The anesthesia was started with nitrous oxid gas, followed by ether and then by chloroform. The chloroform anesthesia had been kept up for some minutes when the operation was started



Fig. 5.—Erdman's Modified Allis inhaler. A, B, Metal frame. C, side plate pushed back to open fenestrums; dotted outline shows its full size and shape closing the opening; D, top plate, with open knob, to fit snugly over metal frame.

¹ Amer. Med., Apr. 16, 1904.

² Amer. Med., Sept. 19, 1903.

and the patient began to struggle. As soon as the struggling commenced the chloroform was pushed aside and the patient received no more of the agent. The struggling ceased, the patient became very pale, the respirations became slow, and there was no radial pulse. In spite of artificial respiration and stimulation by drugs and electricity the patient died. No autopsy was permitted.

A new method to facilitate operations in the mouth for the purpose of **minimizing the dangers of aspiration of blood during general anesthesia** is presented by Herzog¹ (New York). The method consists in intubation and connecting the intubation tube by means of a tightly fitting end-piece with a rubber tube which is passed through the patient's nose so that the expired air or anesthetic is taken into the lungs through the tube passed through the nose. The steps of the procedure are as follows: "After intubating the patient, insert the plug into the end-piece, so as to occlude it and prevent it from becoming clogged with nasal mucus. Pass the rubber-tubing, to which the end-piece is firmly wired, end-piece first, through the nose, and when it shows behind the soft palate, take hold of it by means of a forceps and extract the plug. Then take hold of the end-piece by means of a laryngeal forceps and insert firmly into the opening of the intubation cannula. Thus the larynx is occluded as safely as can be desired. The patient will breathe through the rubber tube and the anesthetic can be administered in this way as easily as through the tracheotomy tube."

George W. Spencer² (Philadelphia) discusses his personal experience in the **use of general anesthetics**, paying particular attention to the choice of the anesthetic to be used and the method of its administration. In the first place, stress is laid upon the importance of the anesthetist keeping his eye constantly upon the patient and his finger upon the pulse. It is thought that even the keeping of a record by the anesthetist is objectionable because it distracts his attention. Such a record should be kept by an assistant. Strong, healthy young men of good muscular development do not take general anesthesia as well as do those of more feeble circulation. In such cases relaxation is often obtained with difficulty and sometimes the anesthetist is requested to change from ether to chloroform. This is not thought, however, to be a good plan, since when the patient is struggling and taking deep inspirations chloroform is very dangerous, as it may be inhaled in a too concentrated state. Ether is considered the safest agent in children. Although ether at one time was considered contraindicated in brain operations, Spencer enumerates 41 cases of operations upon the brain in which he has administered this drug without bad effects. In abdominal work he also believes that ether is preferable to chloroform. In operations upon the nose and mouth chloroform is preferable, because it interferes less with the work of the surgeon. In operations upon the chest when dyspnea is marked, no anesthetic should be given until the dyspnea is somewhat relieved. Chloroform and oxygen he believes to be better in this condition. Spencer does not believe that age is any criterion as to the anesthetic to be employed. His

¹ N. Y. Med. Jour., May 28, 1904.

² Amer. Med., July 11, 1903.

youngest patient was 24 hours old and his oldest 89 years. In both cases ether was employed without any bad effects. When patients are addicted to the use of alcohol, opium, or any other drug, it is believed to be a good plan to allow them a moderate-sized dose of their favorite drug before beginning the anesthetic.

Preston Satterwhite¹ (New York) states that he has recently **successfully anesthetized with chloroform** 10 patients for operation at the Hospital for Ruptured and Crippled **while they were asleep**. He finds that there is little difficulty in producing rapid and profound anesthesia without the slightest struggle or apparent consciousness. The 10 patients referred to varied in age from 4 to 9 years. The Eschmarch inhaler and director were used, and at first great care was taken not to touch the patient. After the primary stage ether is substituted for the chloroform. Satterwhite doubts whether a patient could be anesthetized with ether while asleep without knowing it.

An interesting article in relation to the history of anesthesia is that contributed by W. T. G. Morton² (Boston) on **the first use of ether as an anesthetic**. He relates his experience at the battle of the Wilderness during the late Civil War.

A. W. Morton³ (San Francisco) reports a case of **excision of the superior maxilla under medullary analgesia**. The patient was a man 39 years of age. He was suffering from a carcinoma involving the right superior maxilla. The cocaine was injected into the third lumbar space after dissolving it in the cerebrospinal fluid. The patient's temperature remained normal throughout the operation and his pulse ranged from 90 to 100. He was not nauseated and frequently declared that he had no pain. The entire bone was removed, the hemorrhage being controlled by pressure and the cautery. The deformity resulting from the removal of the bone was 2 months later largely overcome by the injection of paraffin. One of the great advantages claimed for this method of producing analgesia is that, the patient being conscious, there is no danger of foreign material entering into the air-passages and the dreaded postoperative pulmonary complications are not so apt to arise. The operator is not troubled by the anesthetist nor the cone, which so frequently interfere with surgical work. It is claimed that the method can be employed in heart and lung diseases and kidney complications with less danger than any general anesthetic. Morton also claims that the shock of the operations is diminished.

Whiteford⁴ relates his personal experience with **ethyl chlorid as a general anesthetic**. It consists in 150 administrations of the agent either alone or as a preliminary to ether and chloroform. Two patients developed asphyxial symptoms, probably due to overdosage, but the condition caused little anxiety. The ages of the 150 patients varied from 14 days to 73 years. Whiteford thinks the agent an excellent substitute for nitrous oxid. It may be given in any closed ether inhaler. The longest duration of anesthesia in Whiteford's cases was 35 minutes. Care must

¹ Med. Rec., Apr. 23, 1904.

² Jour. Am. Med. Assoc., Apr. 25, 1904.

³ Amer. Med., Mar. 21, 1903.

⁴ Bristol Med.-Chir. Jour., Mar., 1904.

be taken to exclude air during the administration of the ethyl chlorid. When this is done, the narcosis is usually complete in from 1 to 1½ minutes. Whiteford shows that the expense of ethyl chlorid anesthesia is less than that of nitrous oxid anesthesia. Hewitt is quoted as saying that ethyl chlorid is as safe an anesthetic as ether. He places the mortality somewhere between 1 in 10,000 and 1 in 15,000. "Ethyl chlorid, given for short operations, produces an anesthesia which lasts more than twice as long as that of nitrous oxid. In short dental operations ethyl chlorid, by producing muscular relaxation, does away with the preliminary gagging, which to many patients is the most objectionable part of nitrous oxid anesthesia. From its portability and power of rapidly inducing a general anesthesia which is followed by quick recovery and slight after-effects, ethyl chlorid bids fair to come into general use, especially in private and country practice, and, as a preliminary to ether or chloroform, appears likely in a great measure to supersede nitrous oxid."

F. O. Allen¹ reports a **death during general anesthesia produced by ethyl chlorid.** The patient was a colored man 28 years of age, an epileptic, who was admitted to the Pennsylvania Hospital for an incarcerated inguinal hernia. The hernia was painful and there had been considerable vomiting, but not of a fecal character. The temperature was about normal, his pulse was small and 110 a minute. His general condition was poor. Anesthesia was started with ethyl chlorid and progressed satisfactorily until narcosis was approaching, when the change to ether was made. Just as the ether was started the patient gagged and vomited an enormous quantity of almost clear watery liquid which for a time spurted from the mouth in a continuous stream without retching or inspiratory effort. It is thought that this vomiting kept up for 2 or 3 minutes. When it ceased, respiration was not resumed, cyanosis was present, and no pulse could be felt. Artificial respiration with traction on the tongue was continued for some minutes without effect, it being impossible to cause air to enter the lung. No obstruction could be felt in the throat or trachea nor was there any solid matter in the vomit. Permission for autopsy was absolutely refused. About 15 grams of ethyl chlorid had been used when the catastrophe occurred. [This is the first death under ethyl chlorid with which we are familiar in an experience extending over several hundred cases, and after a careful consideration of this report we are inclined to agree with Allen that it is not likely that the ethyl chlorid alone was responsible for the death, and that it would probably have occurred with any anesthetic. In fact it seems to us that the death was probably due to the inspiration of a quantity of the liquid vomited.]

E. E. Montgomery and P. P. Bland² present their conclusions regarding the use of **ethyl chlorid as a general anesthetic in gynecology.** It was found that this agent, when administered as a general anesthetic to patients with normal circulation, produced but a slight decrease in the arterial tension and no decided disturbance in the pulse-rate. Stress is laid upon the fact that the drug produces very little irritation of the

¹ Am. Jour. Med. Sci., Dec., 1903. ² Jour. Am. Med. Assoc., April 2, 1904.

respiratory mucous membrane, and consequently the distressing symptoms resulting from excessive secretion are avoided. The authors believe ethyl chlorid to be decidedly safer than chloroform and possibly safer than ether. They have never observed a symptom from its use which caused apprehension. They have employed an inhaler devised by Tiemann & Co., which is very satisfactory and inexpensive. This inhaler is composed of an oval rubber cone containing a fenestrum in its roof into which a tube 5 cm. in length is secured and through which the ethyl chlorid is sprayed. To prevent the anesthetic coming in contact with the face, several layers of sterile gauze are secured over the end of the tube. The same preparation should precede the administration of the anesthetic as when ether and chloroform are used. The usual time required for complete anesthesia is from $\frac{1}{2}$ to 2 minutes. They have never failed to secure operative anesthesia, though in a certain number of cases relaxation was more marked than in others. Given as a preliminary to ether, ethyl chlorid is heartily commended. It saves one from the excitement that arises during the first stage of ether narcosis, and it decreases the amount of ether required to maintain anesthesia. The authors have continued ethyl chlorid anesthesia for 54 minutes, and under its influence have performed hysterectomy and various other operations on the pelvic viscera. The anesthetic is particularly valuable for the purpose of producing narcosis for a pelvic examination. The anesthesia is so quickly produced and the patient recovers from it so promptly that its employment in office practice is permissible. In feeble patients requiring vaginal incision for pelvic drainage it is an ideal anesthetic, since its administration need not be begun until everything is prepared and the surgeon ready to make the incision. The disadvantages are stated as follows: "(1) The patient passes under and out of its influence so quickly that the administrator must be unusually expert to avoid, on the one hand, profound anesthesia, and on the other, the emergence from its effects at an important stage of the operative procedure. (2) The expense of the drug excludes its use in a general clinic, but the increased employment of this agent, which must necessarily follow the general recognition of its advantages, will doubtless result in a reduction of its cost."

A. F. Erdmann¹ (Brooklyn) recommends **ethyl chlorid as a general anesthetic**. He quotes very freely from literature, shows its extensive use both in France and in Germany, and its great safety even in the extremes of shock and in diseased conditions of the respiratory and vascular organs. Some little difficulty has been noted in determining just when the patient was fully anesthetized. Erdmann believes that when the patient begins to snore he is ready for operation. He quotes McCardie as saying that it is one of the cardinal signs of a fully established anesthesia. Anesthesia is often complete when muscular relaxation is incomplete and the conjunctival reflex has not been lost. A cataleptic state is described in which anesthesia is incomplete but analgesia is complete. One of the advantages of ethyl chlorid over nitrous

¹ Med. News, May 28, 1904.

oxid is that however much the patient speaks or moves during the operation, he never says afterward that the pain was felt but the power to manifest it was absent, a complaint which is frequently made after nitrous oxid anesthesia. Chlorid of ethyl is considered to be the least dangerous of all anesthetics except nitrous oxid. It is pointed out that most of the deaths occurring during its use have been unjustly affirmed to have been caused by it. The following rules are suggested: "The ethyl chlorid must be chemically pure. The mask must fit the face snugly. As little as possible should be given—a half a dram is a good initial mass dose. Mauretta gave up to 3 and 4 drams without ill effect, but the general opinion is against such practice. A graduated container must be employed, else the dosage is uncertain."

Dansey¹ (Sydney) states that for a number of months he has used **ethyl chlorid as a general anesthetic** at the Royal Prince Alfred Hospital. For short operations ethyl chlorid offers the following advantages: "(1) It is, on the whole, quicker in the initiation of anesthesia. (2) There is none of that disturbing duskiness which is more the rule than the exception with the administration of gas. (3) Ethyl chlorid gives a much longer narcosis—about 1 to 2½ minutes. (4) The apparatus necessary is so easily portable as compared with that of gas. (5) Ethyl chlorid is cheaper." Dansey states that it is his custom always to initiate the narcosis of ether with ethyl chlorid for the following reasons: "(1) It is more pleasant to take than ether direct. (2) Etherization is more rapidly induced—average time about 2 to 3½ minutes. (3) Spasm and excitement, which is frequently met with in the initial stage of etherization, does not occur. (4) In plethoric and obese patients, owing to the quick smooth onset of anesthesia with no duskiness, the subsequent etherization is much simpler and more satisfactory."

Huggard² states that **ethyl bromid** as a general anesthetic and as a preliminary to ether has passed through the first and second stages of indiscriminate laudation and total abandonment and has now reached the final stage of routine employment in suitable cases and in proper doses. The drug is free from danger when administered by inhalation in single doses of from 15 to 30 grams, or from 2 to 6 fluidrams, but prolonged or repeated doses are dangerous. The commercial preparations of this agent are most unsatisfactory. An examination of 50 specimens showed that 30 were not suitable for anesthetic purposes owing to the presence of impurities. It should be purchased in bottles sufficient for a single administration, and if any of the contents is not used, it should be thrown away. It should be given on a mask which fits the face closely so as to shut off all air. The entire dose should be poured at once on the mask. The patient while taking it holds the arm up. With the falling of the arm any short operation may be performed. The inhalation is discontinued as soon as the patient is anesthetized. If a longer anesthetization is desired, the moment the patient becomes unconscious and the arm falls ether should be quickly substituted. Very young children, weak and anemic persons, and those suffering

¹ Australasian Med. Gaz., June 20, 1904.

² Lancet, Sept. 12, 1903.

from Bright's disease, cardiac weakness, or alcoholism are not fit subjects for bromid anesthetization. The drug does not produce muscular relaxation. Huggard states that if the drug is pure and administered in proper doses, it is as safe as ether.

Magnani¹ has shown that **yohimbin possesses unexpected anesthetic properties**. He states that 5 drops of a 1 % solution infiltrated into the skin produces absolute anesthesia lasting about 1½ hours. No toxic effects have been noted. The use of yohimbin as a local anesthetic in ophthalmic work has been well established.

Francis W. Bailey² (Liverpool) presents some **observations on somnoform**. This agent, which was named by Rolland, of Bordeaux, is composed of 60 parts of ethyl chlorid, 35 parts of methyl chlorid, and 5 parts of ethyl bromid. The combination of these three drugs was worked out with an object in view, for, from the diffusibility of methyl chlorid, which evaporates at 23° below zero, we obtain instantaneous anesthetic action; from ethyl chlorid, the base of the anesthetic, prolongation of the too transient or fugitive effects of the methyl chlorid; and, lastly, from ethyl bromid, in feeble proportions of 5 parts, we obtain, by producing an analgesic condition, prolongation of the time required for operating; in other words, we get a transitional state between absolute anesthesia and the return, sometimes too rapid, to consciousness and sensibility. The dose is roughly about 1 dram, and is sprayed upon a cone-shaped mask which is absolutely air-tight, fitting the patient's face accurately. The pledget of cotton-wool in the apex of the mask has the agent sprayed upon it and then the mask is immediately applied to the face. The breath may be held at first, but on the patient becoming accustomed to the vapor, and told to swallow, respiration is resumed, and in a few seconds anesthesia is obtained. The greatest objection Bailey has found to this agent is the difficulty in telling when the patient is thoroughly anesthetized. Three indications of complete anesthesia are given, but they are not altogether satisfactory. They are fixation of the eyeballs, the patient having been told to keep the eyes wide open; and dropping or rigidity of the upheld arm, the latter being frequently coupled with a cataleptic condition. Bailey was struck with the extraordinary rapidity with which the patients became narcotized. The most valuable sign of complete anesthesia is the dropping of the hand, but this does not always occur. It is thought that the respiration is as good an indication as any of the degree of anesthesia; at first it is irregular, and it may be deep, but subsequently it becomes prolonged, slightly shallower and regular; there is no cyanosis—the patient appears as if just asleep. The corneal reflexes are never absent. In none of Bailey's patients was there any nausea; in the majority of them, however, food was withheld for some hours before the administration of the drug. It is said that no preparation is necessary for the administration of this agent. A very essential point in the administration of somnoform is the absolute exclusion of all air. In single administrations of the drug it generally took from 15 to 20 seconds to induce anesthesia, giving from

¹ Münch. med. Woch., July 14, 1903.

² Med.-Chir. Jour., Jan., 1904.

25 seconds to $2\frac{1}{2}$ minutes to operate. The largest number of teeth extracted was 13, next 11, and in several cases 6, 8, and 5 teeth. In one instance where repeated administration was made the patient was under the anesthetic $3\frac{1}{2}$ minutes, during which time 19 teeth were extracted. The drug possesses an analgesic effect which is frequently manifested when the anesthesia is not complete. In none of the cases of single administration, with the exception of one when there was violent headache, were there any symptoms to cause anxiety, but in one of repeated administration there was some collapse; and, moreover, in these cases the recovery partakes more of the nature of that from chloroform in a minimized form. Although in Bailey's experience somnoform has been used only for these brief periods, cases have been reported in which the anesthesia has been kept up for an hour.

Volkman¹ reports the results in 20 cases of **morphin-scopolamin anesthesia**. Many of the operations were extensive abdominal ones. The first dose of the combined drugs was given 4 hours before the operation, a second dose 2 hours later, and a third dose one-quarter hour before the operation. In 3 out of the 20 cases the operation was completed without administering any ether at all. In the majority, however, a small amount of ether given drop by drop was necessary to keep the patient thoroughly quiet. Volkman uses smaller doses of the drug than others have employed, as he considers that the bad results in some of the published cases have been due to the large dosage. In none of the cases was there the slightest disagreeable after-effect. Even where ether had to be employed, the patients had lost consciousness. One of the great advantages of this method is that the patient loses consciousness while he is still in his bed and knows nothing of the preparation for the operation or of the administration of the ether when this is necessary. The sleep lasted on an average for 6 hours, the shortest case being 3 hours. Complete muscular relaxation was obtained in 4 cases without the administration of ether.

Frank G. Aldrich² reports a case of **amputation of the leg under hypnotism**. A surgical note is added by Mr. Daniel, who performed the operation. The patient was a woman, 38 years of age, who had suffered for 17 years from extensive ulceration of both legs and necrosis of the left tibia. Amputation had been recommended, but the patient had declined the operation because of an unfortunate experience with chloroform at a previous time. It was this fact that made Aldrich decide to employ hypnotism. The patient was hypnotized repeatedly before the operation, and under its influence the leg was prepared for the operation. In each instance the hypnotism was very successful. Finally, preparations for operation having been made, the patient was again hypnotized and disarticulation at the knee-joint performed. The patient made no complaint of pain during the operation and at no time did she move her leg. When the structures in the popliteal space were divided, no change in the patient's attitude was noted. The wound healed satisfactorily. [In 1851 Guérineau, of Poitiers, amputated the thigh of a

¹ Deut. med. Woch., Dec. 17, 1903.

² Lancet, Aug. 22, 1903.

patient in a state of hypnotic anesthesia. Esdaile did many operations in India with the patients hypnotized. Surgical hypnosis was largely abandoned because of the conviction that either ether or chloroform is safer, because the hypnotic sleep cannot be induced in all, because even in susceptible persons a number of séances must be carried out for a number of days before operation, and, finally, because in some cases hyperesthesia is produced instead of anesthesia.]

ESOPHAGUS, STOMACH, AND DUODENUM.

James E. Thompson¹ reports 3 interesting cases of **stricture of the esophagus due to typhoid ulceration**. The first patient was a boy 17 years of age. The stricture began to develop in the fourth week of typhoid fever. The boy came under Thompson's care 9 months after the subsidence of the fever, at which time the stricture was so tight that it required about half an hour to swallow a glass of water. With difficulty the stricture was gradually dilated and the patient was sent to his home with a set of bougies with instructions to pass them regularly. Soon after his return home and before the bougies had been passed he began to have pain at the site of stricture and developed fever and difficulty in swallowing. He gradually became weaker and died 3 months after his return home. The second case is that of a man 26 years of age who also began to develop difficulty in swallowing at the end of his fourth week of typhoid. Ten months after the onset of the fever he was unable to swallow a drop of water. In this case also dilation was possible, and nearly a year later the patient was getting along well. The third case was a man 26 years of age in whom the symptoms of esophageal stricture developed at about the same period of his illness. He was seen by Thompson 4½ months after the onset of the fever. At this time he was able to swallow liquids only. The treatment employed in the former cases was successful in this also, although a recurrence of the symptoms took place 3 weeks after his discharge, but these were a second time relieved by dilation. Thompson quotes extensively from the meager literature of this subject, showing the rarity of esophageal stricture from typhoid ulceration. Dysphagia has been the commonest symptom in the reported cases, and in most instances it has been the only symptom. Hematemesis was noticed in one case. There is no reason to believe that in any of the reported cases the drugs given during the course of the fever played any part in the production of stricture. Thompson has been able to find 9 cases reported, and with one exception they have all occurred in males.

J. R. Eastman² (Indianapolis) describes the **treatment by direct dilation of cicatricial esophageal stricture**. He emphasizes the fact that his remarks apply only to cicatricial contraction following the destructive action of escharotics or direct traumatism. Before attempting the dilation of an esophageal stricture the greatest care should be taken to make sure that the obstruction is not due to some other condition

¹ Ann. of Surg., May, 1904.

² Ann. of Surg., Feb., 1904.

in which dilation might be not only of no benefit, but very disastrous. Gastrostomy for the purpose of aiding dilation is not thought to be of much advantage. For the purpose of dilating these strictures Eastman describes a malleable bougie to which can be given any desirable curve and the direction of whose tip may be controlled. These bougies are of spiral wound steel wire, filed flat and smooth, and contain a withdrawable soft leaden core. They are made in various lengths and diameters. The core is so soft as practically to eliminate the danger of trauma. The core can be withdrawn when the tip of the instrument has passed the stricture. The leaden core also makes it possible to determine readily the position of the sound while in the esophagus by means of the röntgen ray. A whalebone filiform is also described which can be attached to the end of the bougie. In this way the filiform can be introduced through the stricture, the bougie attached to it, and made to follow it into the stomach. Eastman has also devised a dirigible sound the distal end and tip of which may be moved at will while the instrument lies in the esophagus by the manipulation of an adjustable screw at the proximal extremity. He states that the ordinary bulbous sounds for esophageal stricture are unsatisfactory because they cannot be kept in the grasp of the stricture sufficiently long or accurately to produce gradual dilation. The swallowing of a weak solution of cocain or adrenalin will usually facilitate the introduction of an esophageal sound because of the vascular depletion produced by these agents. The cocain solution will also in most cases relieve nausea and prevent spasm. Eastman finds it easier to introduce the esophageal instruments when the patient's head is tilted forward, the tissues of the neck being more relaxed in this position.

T. L. Coley¹ reports a case of **stricture of the esophagus complicated by subdiaphragmatic abscess, loculated empyema, and purulent peritonitis**. The stricture was the result of swallowing 2 ounces of liquid solder with suicidal intent. It is thought that there developed an esophagitis of phlegmonous type which led to the formation of a subdiaphragmatic abscess. This communicated subsequently with the left pleura, producing an extensive empyema which was loculated and separated the lobes. Finally, there developed a fatal purulent peritonitis.

William Thomas² reports a case of **congenital occlusion of the esophagus** and discusses this subject. He was called to see an infant 2 days old who was unable to swallow. An examination by the finger revealed absolute occlusion of the esophagus at about its juncture with the pharynx. The child died from starvation on the fourth day. No postmortem examination was allowed. Examination of the literature has revealed but little on this subject. In the fifth edition of Gibson's Anatomy, published in 1697, there is described a case quite similar to the one reported in which a postmortem examination was made and in which the lower portion of the esophagus opened into the trachea. Hirschsprung in 1862 reported 14 cases, in 11 of which there was a complete postmortem examination. There appeared to be two forms of

¹ Medicine, Mar., 1904.

² Lancet, Feb. 6, 1904.

congenital occlusion of the esophagus, one in which the upper and lower portions are united by a fibrous cord and another in which the lower part opens into the trachea or one of the bronchi. The latter seems to be the more common condition. Altogether Thomas has been able to collect 19 cases of this anomaly. All the patients died, though one lived 11 days on rectal feeding. The diagnosis is not difficult, since examination with the finger or bougie will reveal the condition. Of the operative procedures gastrostomy is the most advantageous. Steward's case was the only one of those reported which was operated upon.

Whipham¹ reports a case of **rupture of the esophagus**. The patient was a man 27 years of age who was thrown from a horse and struck on his head, receiving a compound depressed fracture of the vault. Allingham operated upon the patient, removing considerable depressed bone. "Five hours later the patient was still deeply comatose and sweating profusely. The breathing was noisy but not stertorous and the pupils still preserved the same inequality. Altered blood and food-stuff had been vomited several times. Eight hours after the operation the patient died from respiratory failure, having become very cyanosed during the last 10 minutes of life. The temperature shortly before death was 106.6° F." At the necropsy, 24 hours later, there was surgical emphysema to a moderate degree over the upper part of the chest-wall in front. "The left pleura contained about a pint of fluid and semisolid masses, evidently food, which had a sour odor of beer, and the membrane itself had lost its luster; the right pleura was normal. At the lower end of the esophagus, just above the diaphragm, was a longitudinal rupture of the wall on its posterior aspect, 1½ inches long, which communicated directly with the left pleural cavity. There was no sign of a previous lesion at the site of rupture, which was obviously of recent occurrence. The upper part of the esophagus contained some food. The rest of the alimentary tract was normal." The explanation of this rupture is supposed to have been as follows: "The patient was evidently thrown from his horse and pitched on his forehead, fracturing his skull. The neck was then either sharply flexed by the after-coming trunk, and this, accompanied perhaps by a sudden muscular contraction of the pharynx, caused an obstruction to the forcible ejection or expression of food from the stomach and so gave rise to the rupture; or, on the other hand, it may have been overextended by the man turning a half somersault while his forehead remained in contact with the ground, in which case the esophagus would have been stretched over the cervical vertebrae with a similar result. The former seems the more probable explanation as the rupture was on the posterior surface of the gullet." In 31 cases which have been collected of rupture of the esophagus, 24 were in males and 4 in females; in 3 the sex was not stated. The majority of the patients were of middle age, 17 being over 30 and 9 below. Alcohol seems to be a predisposing factor. In all these cases the lesion was apparently brought about by the act of vomiting, though in 2 the exact cause was unknown. In all but one of the cases the rupture occurred in

¹ Lancet, Sept. 12, 1903.

the lower third of the esophagus, generally just above the diaphragm, and in all except 3 it was longitudinal in direction. In 4 the lesion was on the left side, in one on the anterior wall, while 5 were posterior, of which one was rather to the right and 2 were rather to the left. In 21 the aspect of the lesion was not mentioned. The reason for the frequency of rupture in the lower third of the tube is supposed to be that in that region there are only involuntary muscle-fibers. Emphysema of the chest-wall or of the neck and face was present in 16 cases and absent in 3, while in 12 no mention is made of this phenomenon. Pneumothorax was present in the same proportion. All the cases were fatal, 22 dying within 24 hours; 2, however, survived as long as $7\frac{1}{2}$ days.

Andrew Fullerton¹ records a case of **foreign body impacted in the esophagus of a child of 7 for 7 months, and successful removal by esophagotomy**. Among the interesting features in this case is the fact that a halfpenny remained lodged for 7 months without definite symptoms until 3 weeks before admission, when the girl became ill and brought up foul-smelling material at intervals. The coin was located with the röntgen rays opposite the bodies of the third and fourth vertebrae. An unsuccessful attempt to remove it through the mouth made the child very ill and caused her to bring up a considerable quantity of foul-smelling, purulent matter. A week later an esophagotomy was done and the coin removed. There was a discharge of very offensive pus at this time. The coin was situated $4\frac{1}{2}$ inches from the opening in the esophagus. The esophagus was closed completely and the external wound drained. The patient recovered.

Donald Armour² records an instance of **breakage of a coin-catcher**. In an attempt to remove a coin from the esophagus of a boy of 5 the house surgeon had the metal portion separate from the whalebone. Examination with the fluoroscope showed the coin to be in its original situation and an obscure shadow in the neighborhood of the lower end of the esophagus. Gastrostomy was performed and the portion of coin-catcher, measuring 5 inches in length, removed from the lower end of the esophagus by means of a pair of curved forceps. The coin was removed from the esophagus from above with the same forceps. The patient made an uninterrupted recovery.

A. E. Halstead³ (Chicago) presents a complete discussion of **diverticulums of the esophagus** and reports a case. The literature of the subject is extensively quoted. Three varieties of diverticulums are described—traction, pressure, and traction-pressure. Traction diverticulums are generally the result of traction made by the shrinking of scar tissue which is attached to the esophagus. It commonly follows inflammation originating in the bronchial lymph-glands at or near the bifurcation of the trachea. Although these diverticulums are generally looked upon as of slight importance, they may be a serious menace to life by perforation either from ulceration or the lodgment of a foreign body, numbers of such cases having been reported. Aside from this danger,

¹ Brit. Med. Jour., May 7, 1904.

² Brit. Med. Jour., Apr. 16, 1904.

³ Ann. of Surg., Feb., 1904.

traction diverticula are likely to become converted into pressure diverticula from the arrest of food and the subsequent distention of the sac from pressure and traction. Traction diverticula are of small size and produce no symptoms by which they may be recognized. It is only when they have become traction-pressure diverticula that a diagnosis is possible. Pressure or pulsion diverticula always produce symptoms by which they may be recognized. Halstead divides pressure diverticula into the following classes: "(1) Those of the pharynx proper. (2) Those at the pharyngoesophageal junction, the borderline cases, or Grenz diverticula of Rosenthal. (3) Diverticula having their origin in the middle third of the esophagus, somewhere near the bifurcation of the trachea, and mostly just above the left bronchus. This is the epibronchial group of Leutgert. (4) The deep-seated diverticula: those in which the origin is below the level of the left bronchus, with fundus a variable distance above, but usually near, the diaphragm. These have been termed epiphrenal diverticula, because most of them are given off from the esophagus a short distance above the diaphragm with the fundus of the pouch resting upon it." Those of the first class are found usually on the lateral wall of the pharynx and rarely on the posterior median aspect, as are those of the pharyngoesophageal junction. Lateral pharyngeal diverticula are usually congenital and probably originate from the remains of the third and fourth bronchial clefts. Any traumatism which causes weakening or rupture of the muscular wall of the pharynx may be an important factor in the development of the diverticula. Excessive intrapharyngeal pressure, such as is produced by blowing on wind-instruments, may, in the case of a weakened wall, cause a dilation which later develops into a diverticulum. Such a diverticulum may consist of mucous membrane only. "Pharyngoesophageal pulsion diverticula are the most common as well as the most important from a pathologic and clinical standpoint. They develop exclusively in the median line posteriorly. At times from traction, as the sac grows larger and is compressed against the vertebral column, they are dragged to one side, usually to the left, the fundus being in relation to the lateral wall of the esophagus. In the course of development of the pouch, the esophagus is also displaced, so that the axis of the pharynx and the orifice of the diverticulum are in a line, permitting easy entrance of food into the sac and obstructing the lumen of the esophagus. Their point of origin corresponds to a triangular space just below the inferior constrictor, where, by the separation of the longitudinal muscular bands of the esophagus and the absence of circular muscular fibers, there is normally a defect in the muscular wall of the esophagus. This point of least resistance in the esophagus has been called the Lainer-Hackermann point." A few recorded cases show that cicatricial stricture of the esophagus may occasionally act as a cause of diverticulum. "Diverticula situated between the pharyngoesophageal junction and the upper border of the sternum are rare, and are probably all of the traction-pulsion group, which have already been considered. Below this, at the level of the left bronchus, there occur occasionally diverticu-

lums which are etiologically distinct from the pulsion diverticulums of Zenker. These are the epibronchial diverticulums of Leutgert. Diverticulums of the lower third of the esophagus are mostly situated just above the diaphragm, and for this reason have been termed epiphrenal. The etiology of this group is not yet clear. Besides the traction-pulsion diverticulums of the lower part of the esophagus, there are a few that are probably due to a constriction of the esophagus at a point where it passes through the diaphragm." Diverticulums of the lower end of the esophagus do not contain any muscular tissue, whereas those of the pharynx and the traction-pulsion diverticulums may have a complete muscular layer. "The symptoms occasioned by diverticulums of the esophagus are generally identical in the beginning with those of a gradually increasing stenosis which, at times, extends over a number of years. Most of those described have been in persons of advanced years, generally over 50. In those in whom the dysphagia dated from early life, congenital stenosis probably occasioned the first symptom, to which later were superadded those of diverticulum." In diverticulums at the upper end of the esophagus the sac empties itself partially or wholly when the patient reclines, and its contents may escape into the air-passages, producing severe attacks of coughing and dyspnea. The various forms of treatment of esophageal diverticulums are discussed by Halstead. When excision can be practised, the most important step in the operation is the closure of the opening in the esophagus. At the present time nearly all operators advocate immediate closure of the opening. Halstead believes that the best method is that which consists in inverting the neck of the sac by a purse-string suture after the diverticulum has been excised. Partial closure with the introduction of a drainage-tube is condemned. Girard in 1895 devised the method of invaginating the entire sac into the esophagus and closing the defect in the muscular wall by sutures. By this method the esophagus is not opened and therefore the risk of infection is but slight. It can be employed only when the sac is small and when the esophagus below the diverticulum is of normal size. It is this operation which Halsted employed in the case reported. The patient was a man 76 years of age. The first symptoms appeared 17 years before the operation. Two years previous to operation it became impossible for him to eat solid food of any kind. At the time of operation the patient was unable to take any kind of food in the upright position and he had rapidly lost weight and strength. "After taking food there was considerable pain, which was referred to the neck above the upper border of the sternum. This pain was relieved by vomiting or by compression of the sides of the neck with the hands, which forced the food previously taken into the mouth. At no time had any blood been vomited." The existence of the diverticulum was positively indicated by the passage of bougies and by a röntgen-ray picture taken after the sac had been filled with a bismuth mixture. The sac was exposed through an incision extending along the front of the sternocleidomastoid muscle. "The superior thyroid veins and artery were divided between ligatures. Dull dissection through a perfectly dry field

readily exposed the esophagus. There was some difficulty experienced in locating the diverticulum. This was overcome by passing a bougie through the mouth into the pouch. By this means the diverticulum was lifted from its bed and brought to the side of the esophagus. The diverticulum was pear-shaped and measured 4 cm. in length and 3 cm. in width. It lay slightly to the left and behind the esophagus. The neck of the sac was a trifle below the lower border of the cricoid cartilage. The sac was very thin and translucent. With the bougie in the esophagus the mechanism of the obstruction caused by the diverticulum could be demonstrated. The lower border of the neck of the diverticulum acted as a valve, projecting into the lumen of the esophagus. The sac was readily freed from its attachments to the surrounding tissue. A purse-string suture of catgut was passed around the neck with the sound in the sac. The sound was then withdrawn and the sac inverted, and at the same time invaginated into the lumen of the esophagus. The purse-string suture was then tied. Three sutures of catgut were then passed through the neck of the inverted sac. These did not penetrate into the lumen of the diverticulum. Over these sutures the longitudinal muscular layer of the esophagus was united by interrupted catgut sutures. A third layer of chromicized catgut sutures transverse to these was introduced. By the latter the inferior constrictor of the pharynx was brought down, covering the first sutures. A large-sized bougie could be passed without difficulty into the stomach." No drainage was employed and the patient made a prompt and satisfactory recovery. For 5 days he was fed by the rectum, but after this he was able to swallow milk without difficulty. Since the operation he has been perfectly well.

Riebold¹ offers a very complete dissertation on **esophageal diverticula**, first calling attention to the great frequency of this condition. Diverticula of varying degrees have been found in 3.5 % of all autopsies in adults, but they have never been met in children under 15 years. The anterior and lateral walls are the most frequent seat. In one case 9 diverticula were found at the autopsy. These diverticula all bear a close relation to the inhalation of dust, and especially coal-dust, and result from indurated lymph-glands. The most frequent variety is funnel-shaped, varying in depth from $\frac{1}{16}$ to $\frac{1}{2}$ of an inch. Food may accumulate in these small diverticula and produce ulceration, or the gland may suppurate and open into the esophagus. Rupture into neighboring organs is also a dangerous possibility. Carcinoma or tuberculosis may develop in the scar tissue. The causation of the pure pressure diverticulum has been a much-debated point. Riebold believes that the pressure of food or forcible expiratory efforts cause a bulging of the pharyngeal wall which has been weakened congenitally or by injury. The diagnosis is not so difficult in these cases and the treatment is satisfactory. Formerly these patients died of starvation or aspiration pneumonia. The first-mentioned types are apparently never diagnosed.

Henry T. Butlin² reports 8 cases of operations for **pressure pouch**.

¹ Virchow's Arch., vol. clxxiii, No. 3.

² Brit. Med. Jour., July 11, 1903.

of the esophagus. Two of these cases have already been reported; the first was operated on in 1893. Since 1898 the remaining 6 cases have been operated upon. In each the symptoms were quite typical of the condition, and in each the operation of von Bergmann was performed. But one of the cases was fatal. It was impossible in this case to pass a tube into the stomach through the mouth, and the wound was closed after passing a tube through it into the stomach. The cause of death was supposed to be sepsis. The patient was 70 years of age. In the other cases a more or less prompt recovery took place. Butlin has notes of 8 other cases in which the symptoms were as typical as in those operated upon. The diagnosis of this condition is considered easy and the following are enumerated as characteristic signs: "(1) Return of fragments of undigested food, not immediately after the food has been taken, but many hours or even a day or two afterward. (2) Gurgling up of gas from the throat, particularly when pressure is made upon the left side of the neck low down. This symptom is peculiarly distressing to the patient. There may also be distinct bulging in this situation when food is taken, but this is not by any means a constant symptom. (3) A bougie is arrested about 9 inches from the teeth. And, if a curved metal instrument is used, the end can often be felt in the posterior triangle of the neck, almost always on the left side." The following suggestions are made regarding the operation: "(1) In order to be sure that there is no stricture of the esophagus below the opening of the pouch a bougie should be passed into the stomach from the mouth at the time of the operation. If this cannot be done before the wound is made in the neck, the pouch should be exposed, separated from the surrounding tissues, and drawn upward out of the wound. With a little manipulation a bougie can then be passed over its mouth. (2) If the pouch is of long standing, and if it is of large size, a soft tube should be passed from the mouth into the stomach and retained for so long as is necessary for feeding; if the patient cannot or will not permit this, or vomits up the tube, it must be passed over a guide every time food is taken, otherwise almost the whole of the food will pass out through the wound in the neck. If this cannot be done, a tube should be introduced into the stomach through the wound in the neck and retained there until healing is nearly accomplished. (3) The less the tissues below the pouch are disturbed, the better. If they are widely opened up, there is liability to septic inflammation spreading down into the posterior mediastinum. (4) No attempt should be made to close the external wound, however carefully the opening of the neck of the pouch has been stitched up. It should be drained by means of a soft drainage-tube. On the other hand, it is very desirable to close the opening into the esophagus; for, although the stitches always give way at the end of 3 or 4 days, the surrounding tissues are by this time sufficiently recovered to render spreading septic inflammation behind and below the site of the pouch very much less probable."

William J. Mayo's ¹ oration on surgery before the American Medical

¹ Amer. Med., and Jour. Am. Med. Assoc., June 11, 1904.

Association was on **the association of surgical lesions in the upper abdomen.** Attempts to study the stomach independent of the associated organs, the liver and bile-passages, the duodenum and pancreas, have resulted in confusion in diagnosis and treatment. A pathologic process starting in any one of these organs may extend to any one of the others. In the study of the diseases found in these organs the same general consideration should be given them as is given to the female generative organs and the urinary tract. Attention is attracted to the frequency with which chronic ulcer of the stomach will produce adhesions to the pancreas and result in secondary ulcer of the duodenum with adhesions to the bile-passages and gallbladder. In the majority of instances a diagnosis regarding the situation of the pathologic process can be made, but in a considerable minority absolute localization of the trouble cannot be determined until the abdomen is opened. The first 4 inches of the duodenum is that in which most surgical complications arise, the last 8 inches of this bowel being protected from disease by the alkaline secretions of the pancreas and liver. The continuity of the mucous surfaces connecting the duodenum, the bile-passages, and the pancreas renders extension of disease easy. The blood-supply of this group of organs is almost entirely from a single source in the celiac axis. Although the physiology of the stomach, duodenum, pancreas, and gall-duets is in a way simple, the causation of common surgical lesions lies in perversion of these fundamental functions. Mayo shows that the early history is of the greatest value in locating the exact situation of the pathologic condition, and in the well-advanced cases it is often of more value than a physical examination. It is shown in considering acute perforations of the organs of the upper abdomen that the profession is not so well acquainted with the symptoms and treatment as it is with those of perforations occurring, for instance, in the appendix. The initial symptoms of perforation are remarkably alike, whether of the gallbladder, duodenum, stomach, or acute perforation of the pancreas with fat necrosis. The onset is essentially the same in each. Under such circumstances it is unnecessary to waste time in attempting to locate the perforation definitely, immediate operation being imperative. In 14 cases of acute perforation of these organs the Mayos have had a mortality of 50 %. In 1150 operations for subacute and chronic benign conditions of this group of organs the mortality was less than 5 %, counting as a death from operation any patient dying in the hospital without regard to cause or time elapsing between the operation and the fatal issue. In perforations of this group operation to be successful must be immediate. "The condition is as imperative as hemorrhage from an artery of the third class." As a rule the history and location of the early acute pain will furnish evidence as to the origin of the trouble. Perforations of the gallbladder are preceded usually by symptoms extending over several days, with a history of gallstones. Early drainage with removal of the gallbladder should give a mortality of not less than 10 %. Although the immediate onset of perforation of the duodenum is extremely acute, there is usually a history of chronic ulcer extending over years. The location of the early

pain is just to the right of the median line. The extravasated fluids gravitate to the appendical region and simulate appendicitis. Operation for acute perforation of the duodenum is rarely successful after 8 hours. Suture of the perforation with suprapubic pelvic drainage and after-treatment in the sitting posture in the early cases should give a mortality of not more than 20 %. In gastric perforations the initial pain is usually to the left of the median line, and early diffusion of the fluids is to be expected. Only 10 % occur without previous symptoms of chronic ulcer. The treatment is similar to that of duodenal perforation. Perforation of the pancreas is not a pathologic entity but a purely pictorial expression; it is a good one, however, and indicates the necessity for immediate peritoneal drainage. The ultimate results of operations in acute perforations are not altogether satisfactory. Mayo believes that this condition will become more generally recognized, however, and the same improvement will be noted in its treatment as has taken place in the case of appendicitis. The diagnosis of chronic infective lesions of the organs of this group is in a far more satisfactory condition. The general mortality of gallstone operations, for instance, is not above 5 %, including all cases, and in the simple ones is only about 1 % or 2 %. As practically all the patients have symptoms on which a diagnosis could be based previous to the complications, it will not be long before early operation in patients otherwise in good health will be the rule, as it is now in chronic and relapsing appendicitis. Chronic infections of the pancreas are usually secondary to gallstone disease. Chronic infective lesions of the stomach are becoming better understood every day as surgical operation discloses the actual condition present. When obstruction of the pylorus is present, the results of operation are most satisfactory. When, however, ulcer exists without obstruction of the pylorus, the ultimate results have not been so good, since there is always a tendency for the newly established gastric opening to become closed. It is in this class of cases that improvement must be looked for. Many pyloric ulcers will be found to have their origin on the duodenal side; gastroenterostomy in these cases produces excellent results. Excision of gastric and duodenal ulcers is open to strong objections, although it would seem to be a wise procedure. In 21 % of the cases more than one ulcer is present. Excision leaves the ulcer tendency unrelieved and more ulcers may form. The suggestion of Rodman, that the pyloric or ulcer-bearing area of the stomach should be excised with closure of the duodenum and stomach and independent gastrojejunostomy done, the Mayos have followed in 5 cases of inveterate ulcer relapsing after gastroenterostomy, with good results. For the operation of Finney a wider field of usefulness is predicted. The Mayos have done this operation 46 times, with 1 death and no relapse. Pyloroplasty should be discarded. Out of 20 operations with no deaths the Mayos have had 7 relapses after this operation. Mayo's oration closes with the following: "The profession may well look on the surgical achievements in this new field of work with pardonable pride. That there are many shortcomings must be admitted, but in the history of surgery there has never been a territory opened up with equal rapidity, nor one in which the

physician and surgeon have worked together in such harmony for the common good."

The surgical treatment of diseases of the stomach from a physician's point of view is discussed by Steven¹ (Glasgow), who takes as a basis for his paper 23 cases occurring in his wards which have been operated upon during the past 8 years. His concluding remark is as follows: "In what has gone before I think I have clearly shown that, with careful selection, there are many affections of the stomach which may be most beneficially and successfully treated by surgical operation. As regards malignant disease, I fear that in the mean time at least the results of surgical interference will be mainly palliative. In cases of ruptured ulcer, of excessive hematemesis, and of dilation we may in many cases confidently expect, not only the immediate saving of life, but a permanent cure of the malady as the result of operation."

An exhaustive study of gunshot wounds of the stomach is presented by Forgue and Jeanbrau.² The paper is extensively illustrated, and a number of these cuts show that it is practically impossible to have a gunshot wound of the stomach without injury of some of the other organs. A table is given of 152 cases of gunshot wound of the stomach divided into those treated expectantly and those treated by laparotomy. The mortality without accompanying visceral lesion when the expectant treatment was carried out was 46%; in those treated by operation it was 42%. When accompanying visceral lesions were present, the mortality was 93% in the cases treated expectantly and 68% in those operated upon. The rule for treatment of gunshot wounds in the left hypochondrium or the perigastrum should be immediate operation. The authors also report a case of gunshot wound of the anterior wall of the stomach in which there was no injury of the posterior wall. The anterior wall was sutured; the patient did well for a time, when he suddenly developed localized peritonitis and died. A postmortem examination was made and it was found that the bullet had remained in the stomach and by pressure had produced ulceration and perforation of the posterior wall. The technic of the operation is carefully detailed.

John G. Sheldon³ reports a case of cirrhosis of the stomach which he believes to have been of benign origin. The patient was a man 52 years of age. Gastroenterostomy was done, which relieved all symptoms. The stomach-wall in this case was at least 1 cm. in thickness. It cut with resistance and the cut surface looked like fibrous tissue. So far as could be observed, the gastric mucosa was smooth and atrophic. The button was passed on the thirteenth day after operation, and 10 months after operation the patient was perfectly well and working on a farm. Although believing that benign diffuse cirrhosis of the stomach is of rare occurrence, yet Sheldon also believes that it does occur, and the present case is reported in support of this statement.

Friedenwald and Rosenthal⁴ (Baltimore) present a statistical report

¹ *Lancet*, May 28, 1902.

² *Rev. de Chir.*, Sept., Oct., Nov., and Dec., 1903.

³ *Ann. of Surg.*, Mar., 1904.

⁴ *N. Y. Med. Jour.*, July 18, 1903.

of 90 gastrotomies for the removal of foreign bodies. To Krängle's list of 76 cases the authors have been able to add 11 from recent literature and 3 which they have been able to obtain by personal communication, bringing the total number to 90 cases. In 68 instances only 1 foreign body was found. In the remaining 22 cases more than 1 body was found. Most of the foreign bodies were metallic and had usually been swallowed in fits of insanity; others were swallowed by individuals exhibiting the talent as a means of livelihood. The age of the patients varied from 9 months to 70 years, and the males and females are about equally divided. The length of time during which the foreign bodies remained in the stomach ranged from a few hours to many years. The symptoms are not distinctive. "They are pain, vomiting, loss of appetite, weakness, and emaciation, but the size and number of the foreign bodies may have but slight effect in the production of symptoms, as is shown in the case reported by Kortman, in which the foreign bodies (shellac stones) remained in the stomach for 16 years." Pain is usually in the epigastrium or in the intercostal spaces between the shoulder-blades. Röntgen rays have greatly aided the diagnosis in these cases. Frequently, however, difficulty is encountered in locating the foreign body; for instance, in the case of Krängle the patient had a dilated stomach and the skiagraph showed the foreign body about the level of the crest of the ilium. An idea of the prognosis may be obtained from the following: "During preantiseptic times 19 cases were operated on, with 15 recoveries and 4 deaths; 78.9 % recoveries. (1) In early operations (at least 10 days after the foreign body had been swallowed) there were 4 cases, with 3 recoveries and 1 death. (2) In late operations, 10 cases: 9 recoveries and 1 death. (3) Time of operations unknown in 8 cases: 6 recoveries, 2 deaths. During antiseptic and aseptic times 71 cases were operated on. (1) Early operations (at least 10 days after the foreign body had been swallowed), 28 cases: 26 recoveries, 2 deaths—92.7 % recoveries. (2) Late operations 29 cases: 25 recoveries, 4 deaths—86.2 % recoveries. (3) Time of operations unknown, 14 cases: 13 recoveries, 1 death—92.7 %."

Monod¹ reports an interesting case of **gastrotomy** performed by Monnier for the extraction of 25 foreign bodies, including 8 teaspoons and one fork. The patient was a man 22 years of age of rather obtuse intelligence. He complained of great pain in the upper portion of the abdomen and was unable to sit up because of it. A mass could be felt in the region of the hepatic flexure of the colon which gave a sense of crepitation when palpated. Because of the position of the mass it was supposed that the trouble lay in the big bowel, and therefore when the abdomen was opened through the right rectus an examination of this canal was made, but proved to be negative. The mass which had been felt was then located in the stomach, and this organ was drawn through the abdominal wound and opened. Exploration revealed the presence of the foreign bodies enumerated above, the whole weighing 230 grams. After washing the stomach out, the wound was closed and the ab-

¹ Bull. de l'Acad. de méd., Oct. 27, 1903.

dominal wound was also closed without drainage. The patient made a satisfactory convalescence except for a localized infection of the abdominal wound. He confessed after the operation that the foreign bodies had been swallowed with suicidal intent. Following the report of this case is an enumeration of other similar ones and a general discussion of the subject.

B. G. A. Moynihan¹ discusses at some length **congenital hypertrophic stenosis of the pylorus**. Among the names which have been applied to this condition are "scirrhus of the pylorus," "congenital stenosis of the pylorus," "hypertrophy of the pylorus," and "congenital tumor of the pylorus." This disease is one which has been much more frequently recognized in the last two years than ever before, and it is evident that many infants dying supposedly of marasmus with vomiting and intestinal obstruction have really been victims of stenosis of the pylorus. The symptoms in these cases are very regular, although at first the diagnosis may be difficult. Soon after birth, sometimes within a day or two, and sometimes not for several weeks, the child begins to vomit its food. This vomiting becomes more persistent as time goes on, although with the dilation of the stomach the food may be retained for a considerable time and then vomited in quantity. Bile is never present in the vomit. A change of diet makes no difference in the symptoms. The child grows progressively worse, losing weight, until finally it does not weigh more than 3 or 4 pounds. The temperature is constantly subnormal and constipation is almost invariable. Sometimes a pyloric tumor can be palpated. If the abdomen is shrunken and hollow, gastric peristalsis can be observed. When these symptoms are present, no doubt should exist regarding the diagnosis. Moynihan discusses the pathology and etiology of this condition, but states that as yet we are able to reach no definite conclusion regarding its cause. Gastric lavage and feeding in small quantities through a tube have resulted in the cure of some cases, but the majority of them, if not relieved by surgical means, are fatal. Surgical treatment consists in dilation of the pylorus, Loreta's operation, pyloroplasty, or gastroenterostomy. Although after stretching the pylorus one would suppose the symptoms would recur, the reported cases do not show this, but, on the contrary, the results have been very satisfactory. Moynihan, however, rather favors gastroenterostomy. "The statistical results, up to the end of 1902, were as follows: Pyloroplasty had been performed 3 times, successfully; in a fourth case, recorded by Sonnenburg, a pyloroplasty was performed, and as the relief was imperfect, a gastroenterostomy was subsequently performed, with good results. This patient was 6 years old, and the case is therefore hardly in the same category as those occurring in infancy. Gastroenterostomy, always anterior, had been performed 9 times: 5 patients recovered, 4 died. In one of these death was due to acute obstruction caused by a Murphy button which had been used to effect the anastomosis. Loreta's operation had been performed 9 times, with 7 recoveries."

¹ Med. News, Oct. 24, 1903

A. E. Maylard¹ deals with **congenital narrowness of the pyloric orifice as a cause of chronic gastric disease in the adult**, and reports 7 cases successfully operated upon. There is no pathognomonic symptom, but those symptoms which suggest the condition are as follows: "(1) The existence of obstinate gastric symptoms during young adult life, not to be accounted for by any of the usually recognized causes, functional or organic. Often the patients are in a fairly good social position, where neither excess nor deficiency in the necessities of life exist; and often, too, the sufferer is one only of a family otherwise healthy in all its branches. (2) The patients are mostly women under the normal standard both in stature and build. It is only somewhat natural to suppose that this is likely to be so, because an amount of development of the fold, which in a viscus of naturally large size might not be sufficient to produce obstruction, would certainly do so in one of less dimensions. My cases were all in women of comparatively small build, and, on account of the usually smaller stature of the female as compared with the male, we may reasonably suppose that the former are more likely to suffer from any undue narrowing of the pyloric orifice than the latter. (3) Another feature of diagnostic significance is the great improvement it is always possible to effect by dieting, but the certainty with which any return to a normal state of living will call forth a renewal of the symptoms. This was most strikingly borne out in my cases." Maylard's general conclusions are: "(1) That there exists a considerable class of patients in young adult life who owe their chronic gastric trouble to a congenital narrowness of the pyloric orifice. (2) That this 'narrowness' is due in many cases to an undue development of the pyloric valve lessening the caliber of the orifice to anything between the normal of 12 to 15 mm., and 2 or 3 mm. (3) That the proper treatment is gastrojejunostomy performed with due regard to the normal disposition of the parts after operation."

Two cases of **hypertrophic stenosis of the pylorus in infants** are reported by E. A. Mackay² (Melbourne), who also refers to the literature and discusses the symptoms and treatment of the condition. The first case is that of a male infant who at birth was practically normal in every respect. He gained steadily and appeared to be thriving, but was somewhat constipated until he was about 4 weeks old, when constipation became more marked and vomiting developed. This grew more frequent and troublesome and the child began to lose weight rapidly. The abdomen became pear-shaped, distended in the upper zone and contracted in the lower, and the peristaltic waves of the stomach were easily seen. Care in diet and washing out of the stomach produced some relief, but in spite of this the patient continued to lose ground steadily. Medical treatment was persisted in for 4 months. At this time the abdomen was opened and the stomach-wall found much dilated and hypertrophied. The pylorus was fully $\frac{1}{2}$ inch in thickness, an inch in length, and as hard as a piece of cartilage. There was no gastrocolic

¹ Brit. Med. Jour., Feb. 20, 1904.

² Interecol. Med. Jour. of Australasia, Nov. 20, 1903.

omentum. Posterior gastroenterostomy was performed with some difficulty, owing to the much thickened mucous membrane of the stomach, which projected into the wound. The child rallied well from the anesthetic and soon gave evidence of great hunger. It was not able, however, to retain any food, and died 36 hours after operation. A postmortem examination showed that there was no peritonitis and no leakage from the anastomosis. Apparently nothing had passed from the stomach to the bowel, the reduplicated folds of mucous membrane having blocked the opening. Either the opening had not been made sufficiently large or the excess of mucous membrane should have been cut away at the time of operation. A probe could be passed through the pylorus from the duodenal side, but even after laying the stomach open it was somewhat difficult to pass it from the stomach side. The second case was that of a male infant 6 weeks old. There was a definite specific history in this case. The symptoms were much the same as in the first patient. This child was obviously dying very rapidly. The pylorus was so tough and thick that it seemed impossible to perform pyloroplasty. The stomach was therefore opened on the anterior surface and the pylorus was dilated. The wound in the stomach was then closed. Vomiting occurred 12 hours after operation and continued until death. Death was due to exhaustion, and occurred 22 hours after operation. A postmortem examination showed that there was neither peritonitis nor leakage. The stomach contained over 2 ounces of fluid, not a drop of which could be made to flow through the pylorus by squeezing the stomach, the pylorus having again contracted, and the hypertrophied folds of mucous membrane closed it like a valve. The liver and spleen were tough and fibrous, undoubtedly from specific disease.

McCaw and Campbell¹ (Belfast) report a case of **congenital hypertrophic stenosis of the pylorus** occurring in a male infant. The patient had characteristic symptoms of the condition and operation was not permitted when first recommended. At the time it was performed the child was in very bad condition. Pyloroplasty was performed, as it was thought to be a quicker and safer operation under the circumstances than gastroenterostomy. The child improved but little after the operation and died on the sixth day, vomiting continuing throughout the entire time. At the postmortem examination it was found that there was a fold of mucous membrane which blocked the new opening, preventing the passage of food.

A case of **pyloric stenosis in an infant** is reported by Townsend² (Boston), a summary of which is as follows: "An infant, healthy at birth, began to vomit at the end of 3 weeks. By careful regulation of the diet the vomiting improved at intervals, but as often returned. The vomitus showed no signs of gastric indigestion; it was projectile in character and often made up of several feedings. Constipation was a feature, but the stools when passed were normal in character. Emaciation became extreme. A visible and palpable tumor appeared in the epigastrium with

¹ Brit. Med. Jour., June 25, 1904.

² Boston M. and S. Jour., Feb. 11, 1904.

dilation and peristalsis of the stomach. Gastroenterostomy was performed successfully as regards the operation, but death ensued in 23 hours at the age of 3 months, after an illness of 10 weeks. The autopsy showed hypertrophy of the pylorus, chiefly of the outer muscular coats, with narrowing of the lumen." [The cause of hypertrophic stenosis is unknown. One theory is that there has been simple fetal overgrowth. Another is that incoördination of the gastric muscles arises as a result of functional trouble with the gastric nerves. Neither theory is satisfactory. If these patients are not operated upon, they usually die in 3 or 4 months. The operation of choice is somewhat uncertain. Gastroenterostomy has been most commonly performed. Cantley and Dent¹ advocate pyloroplasty, claiming that it is simpler and quicker than gastroenterostomy, and also that it permits the surgeon to remove a longitudinal fold of mucous membrane which is usually present. They operated on 2 cases. One got entirely well. The other recovered from operation, but died several months later from enteritis. Cantley and Dent collected 19 reported cases. In 1 case pylorectomy was chosen, in 9 cases gastroenterostomy, in 6 cases Loreta's operation, and in 3 cases pyloroplasty.]

John H. Cunningham, Jr.,² reports a case of **gastric dilation and tetany** which was **relieved by gastroenterostomy**. He devotes considerable space to the discussion of gastric tetany. The case reported is that of a man 28 years of age, who was under Cunningham's care repeatedly during 25 months. The patient was operated upon by Francis S. Watson. For 6 years prior to his coming under Cunningham's care the patient had suffered from attacks of vomiting, occurring at intervals of weeks or months. About 6 months previous the patient began to have difficulty in distinguishing objects both near and far. Glasses relieved this to a great measure, but not entirely. During the attacks of vomiting the sight was very bad. If he left his glasses off, he immediately became nauseated and frequently vomited. This was so marked that the patient kept his glasses on until getting into bed and put them on as soon as he awoke in the morning. In January, 1902, after each attack of vomiting, patient began to notice tingling in the hands. With increasing dilation of the stomach tingling and numbness became pronounced. Later he developed severe attacks of tetany, affecting principally the hands and arms, although the lower extremities were also involved to a less degree. Each spasm lasted from 2 to 3 minutes and was repeated several times at intervals of from 3 to 10 minutes. Under careful treatment the patient improved somewhat, but later the tetany became more marked than before, and during the attacks the patient was semi-unconscious, and although he understood what was said to him, he was unable to speak. Any attempt to pass a stomach-tube produced a spasm. When Watson opened the abdomen, the stomach was found dilated and the pylorus was thickened and indurated. Posterior gastroenterostomy was performed, with the result that the patient was freed from all gastric symptoms, and 12 days after the operation was taking full house diet. He developed phlebitis in the left leg, which slowly improved. Three months after the operation the

¹ YEAR-BOOK for 1904.

² Ann. of Surg., Apr., 1904.

patient had gained 20 pounds, and was perfectly well and had had no gastric symptoms whatever. Six months after the operation he had gained 40 pounds and was still perfectly well. Among the noticeable features in this case was motor aphasia during the attacks of tetany. The various theories regarding the cause of gastric tetany are briefly referred to. The prognosis of this condition is very grave, the mortality without operation being extremely high. In all the cases operated upon there has been found a marked gastric dilation with obstruction of the pylorus resulting in some definite lesion. Gastroenterostomy is the proper treatment when medical means fail to relieve the dilation.

In considering surgical intervention in some diseases of the stomach R. C. B. Maunsell,¹ after dealing with ulcers generally and perforation, discusses hematemesis and melena. Regarding these he makes the following statements: "(1) In all cases in which there is no history of previous ulceration, although the amount of blood lost may be a pint or more, it appears to be wiser not to operate. (2) If the bleeding should recur in some hours, and still be copious, the patient showing signs of continued loss of blood, operation should be considered. (3) If there is a history of previous ulceration, which has not been thoroughly treated, the same advice would apply; but if the history reveal previous failure of nonoperative treatment, operation should be very seriously considered. (4) If the history reveals recurring attacks of severe hemorrhage, operation should be considered imperative. (5) If in a first attack of acute hemorrhage, or in recurring hemorrhage of even a much smaller amount, structural changes in the stomach, such as pyloric stenosis, are clinically evident, or even strongly suspected, I would suggest that operation appears to be the only sensible line of treatment. When it is not deemed necessary to operate, we may advise adrenalin chlorid (Parke, Davis & Co.), 10 to 30 minims by mouth, to be repeated in 4 hours, or 4 of Burroughs, Wellecome & Co.'s tabloids of suprarenal gland broken up in water. If shock is great, the hypodermatic administration of 5 minims of sterilized adrenalin chlorid acts both as a stimulant and hemostatic, while the subcutaneous injection of 2 % sterile gelatin solution, or intravenous infusion of normal saline, are both well-known and worthily trusted remedies in surgical practice. The operative procedures advocated may be divided into 4 groups: (1) Gastrotomy followed by the application of the actual cautery to the bleeding spot; ligature or undersewing of the ulcer or bloodvessel invagination and ligature *en masse* of the ulcer, with supporting sutures applied on the serous aspect; or excision of the ulcer with suture of the resulting wound. (2) Any of these proceedings followed by gastroenterostomy. (3) When the ulcer is at or near the pylorus, excision combined with pyloroplasty, or where the pylorus is not adherent, pylorectomy. (4) Anterior or posterior gastroenterostomy without any special immediate treatment of the ulcer or other bleeding area."

Duplant,² in a discussion of perigastric adhesions, pays particular attention to those which bind the anterior wall of the stomach to the

¹ Dublin Jour. Med. Sci., Jan. 1, 1904.

² Rev. de Méd., 1903, No. 8.

abdominal wall. Such cases should be operated upon whenever they give rise to discomfort and interfere with the health of the patient. It should also be remembered that there is danger of perforation into the general peritoneal cavity. The stomach should be liberated if it is thought that its wall is sufficiently sound to resist a tendency to perforation later. If the surgeon is in doubt regarding the condition of the gastric wall after its separation, the ulcer and the portion which was adherent should be resected. Drainage by iodoform gauze is recommended after separation of these adhesions. Duplant considers gastroenterostomy a necessary part of the operation for perigastric adhesions. Whenever the surgeon does not feel warranted in separating the adhesions, a gastroenterostomy alone should be performed. Separation of the adhesions alone is considered bad surgery, as it does not aid stomach drainage and the adhesions are apt to reform. He is also opposed to two operations for perigastric adhesions and thinks that the adhesions should be separated and the gastroenterostomy performed at the same operative séance. Gastroenterostomy is considered much better than excision for gastric ulcers and productive of much more effectual and durable results.

E. Percy Paton¹ discusses the **surgical treatment of perigastric adhesions**. As operative experience accumulates it becomes more and more evident that in certain cases adhesions and adhesions alone may be responsible for abdominal pain and digestive disturbances of a more or less severe kind. "The following causes may be assigned for these perigastric adhesions in addition to ulceration of the stomach and duodenum: gallstones in the gallbladder or in the common or cystic bile-duct, traumatism, malignant disease, pancreatic disease, umbilical hernia, and possibly tubercle and syphilis." Of these, of course the most frequent are gastric and duodenal ulceration and disease of the bile-passages. When symptoms are due to adhesions only, it is usually in cases in which the attachment is to one of the more mobile organs where there is apt to be more dragging. The nature of the adhesions may be of one or two varieties: "(1) Those in which the attachment is close and the connection broad and covering a wide area, in which case the organs to which it is usually fixed are either the liver or the pancreas; or (2) the adhesion may be long and slender, or cord- or wire-like, this variety being more usual to the colon, gastrohepatic omentum, gallbladder, or to the anterior abdominal wall; this last point of attachment, however, is not at all common. "Adhesions to the anterior abdominal wall may be so dense and thick as to make a distinct palpable tumor. Such extensive adhesions are probably caused by localized perforation of the stomach, adhesions having limited extravasation. The stomach may undergo varying degrees of distortion because of adhesions. The history of patients suffering from perigastric adhesions usually extends over a long period. "The symptoms which the patient finally complains of have not infrequently been preceded by those which are more characteristic of gastric ulcer or gallstone colic. These more acute symptoms

¹ Lancet, Feb. 6, 1904.

have passed off and have left the chronic trouble upon which no treatment seems to have more than a very temporary effect. Of this residual trouble, pain is the most common and characteristic symptom." Pain varies greatly and is not infrequently uninfluenced by taking food. Often it is greatly influenced by the position of the patient. Exertion of a violent character may greatly increase the pain. Local tenderness appears to a greater or less extent and is a most constant feature of the trouble; vomiting is variable. The general health of the patient, as a rule, is not much interfered with; in fact, not as much as might be expected. In most cases only a probable diagnosis can be made, but the symptoms are usually sufficient to warrant an exploratory operation. Paton reports 4 cases of his own and 38 other cases gathered from the literature. The important point in the treatment of this condition is to prevent the reformation of the adhesions, and there is no perfectly satisfactory method of accomplishing this, although various means have been employed. When it is possible, the raw surfaces should be covered by smooth peritoneum. This subject has been carefully studied by Karl Vogel, who employed a large number of different substances to separate the raw surfaces of the peritoneum, but found that none was of very much use. He obtained the best results from either a quantity of sterile saline solution left in the abdominal cavity or the use of a small quantity of a sterile solution of 1 part of gum arabic to 2 parts of saline solution. This authority urges as far as possible the mobilization of the organs which were adherent. This can be brought about by the employment of salines, by changes in position, and by massage. When there is a firm adhesion of the parts and it is impossible or impracticable to separate them, gastroenterostomy is indicated. A cure cannot always be promised, and yet in the cases reported the results have been really brilliant.

The **surgery of gastric ulcer** is discussed by A. B. Mitchell,¹ who reports a number of cases, and reaches the following conclusions regarding the indications for surgical treatment in this condition: "(1) Fortunately there are some cases which offer no difficulty. All cases in which the cause of symptoms is mechanical are essentially surgical. By no possibility could medicinal or dietetic treatment be expected to cure either an hour-glass stomach or a case of pyloric stenosis. The former condition, however, is rarely diagnosed previously to operation. The latter is now comparatively easy to detect. For dilated stomach, treatment by washing out is a very favorite one and gives great relief at first by removing the toxic products of feeble digestion and excess of acids, but at the best it is only palliative; and while it may be recommended in the first instance, common sense suggests that the sooner the actual cause of the dilation is removed, the better, as the risk of operation increases in direct proportion to the delay. (2) There is, however, a very large proportion of cases in which no such definite indication exists. Here the question becomes one for the physician. I am quite satisfied that he is not justified in recommending operation till he has exhausted every other method

¹ Lancet, Aug. 29, 1903.

of treatment, and I do not think that these cases should be submitted to early operation—the acuteness of the symptoms and response to treatment must decide this. Before any operation is undertaken the patient should be submitted to a period of prolonged rest in bed (not less than one month) with rigid diet or rectal feeding. If this fails to give relief, operation is clearly indicated. On the other hand, it is obviously wrong to allow sufferers to struggle along year after year in the position of chronic invalids, useless to themselves and a burden to their friends, without at least offering them the chance of relief by surgical means. (3) Hematemesis sometimes calls for surgical aid, but the operative mortality is very high. A great difficulty lies in the surgeon's way in all these cases. He can rarely say definitely what he is going to do till the abdomen is opened. The operation in this sense, at least, must be regarded as exploratory, but with increased accuracy of clinical diagnosis and the knowledge gained by operative work our opinion will gradually become more definite and precise."

John C. Munro,¹ in a paper on the **surgical treatment of gastric ulcer**, urges physicians to refer their patients to the surgeon at an earlier period than is their custom. An operation as performed on the average patient with a mortality so small that it may practically be disregarded becomes serious or even unjustifiable when done in the presence of persistent hemorrhage, prolonged sepsis, starvation, absorption of ptomains, etc. It is not fair to lay all the blame at the surgeon's door when failures follow operations under the conditions just mentioned. The association of the surgeon and physician in the treatment of persistent gastric ulcer should be such as it has become in the case of appendicitis. The internist is advised to study gastric ulcer not alone from its pathologic side, but to witness operations and see the ulcers and their complications. Munro does not put great faith in diagnoses based upon chemic analysis. Mikulicz is quoted as saying: "The danger to life from gastric ulcer is at least not less, but probably far greater, than the danger of a complete modern operation." No hard-and-fast rules can be drawn between the cases which should be treated medically and those which should be turned over to the surgeon. Munro, however, considers the following types as surgical: "Probable cases of relapsing acute hemorrhage. Cases with hemorrhage if persistent and causing anemia. Perforation. Recurrent ulcer, pure and simple, attended with dyspepsia and starvation. Pyloric obstruction. Adhesions following ulcer or independent of it. Scar contraction of the body of the stomach. Some cases of intractable dyspepsia, perhaps originating in an ulcer, and for which no definite pathology is known."

A study of 14 cases of **perigastritis resulting from gastric ulcer** treated by Jaboulay causes Delay and Cavaillon² to believe that troublesome perigastric adhesions are the result of active ulceration in the gastric mucous membrane. They state that when the ulcer is once healed, the adhesions are absorbed and symptoms disappear. Occasionally a

¹ Brit. Med. Jour., Aug. 20, 1903.

² Rev. de Gyn. et de Chir. Abd., March and April, 1904.

dense adhesion may produce symptoms after healing of the ulcer, but this is not often the case. If their conclusion is correct, then treatment should be directed to the ulcer and not to the adhesion, mere separations of the adhesion being insufficient, and, on the contrary, separation may provoke perforation. Gastroenterostomy will usually cause the ulcer to heal, but often does not produce a cure. The ideal treatment is resection of the ulcer, and it should always be practised when the disease is accessible. When abscess is present, drainage should be instituted without disturbing the adhesions. This is easy of accomplishment when the abscess lies anteriorly or underneath the liver, but is both difficult and dangerous when the pus is in the lesser peritoneal cavity.

Moynihan¹ (Leeds) presents a study of 100 cases of **gastroenterostomy for simple ulcer of the stomach and duodenum**, this being the number operated upon by him up to October 1, 1903. The mortality in this series was two. Eighty-five persons were operated upon for chronic ulcer with intractable dyspepsia, or dilated stomach. In this series there was one death. Fifteen persons were operated upon for profuse and recurring hemorrhage, with one death. Among these 100 patients there were 56 females and 44 males. In 10 cases the induration about the ulcer was so great as to lead to a diagnosis of tumor. In two of the cases stomach trouble had been present since birth, vomiting in early infancy having occurred. In one of these there was pyloric thickening with complex adhesions, and in the other the pylorus was like a thick, rigid tube and there were no adhesions. It is thought that in both congenital malformation of the pylorus was present. In 58 cases but a single ulcer was noted. In 20 cases 2 ulcers were found. In 4 cases 3 ulcers were found, and in 7 cases the ulcers are described as multiple. In regard to this matter Moynihan states that with increased experience and a more thorough examination of the stomach he now finds multiple ulcers where previously he overlooked them. In the last 50 operations, for instance, more than one ulcer was found on 22 occasions; duodenal ulcer alone was met with in 9 cases; duodenal ulcer with one or more gastric ulcers, in 13 cases. The majority of the ulcers were in the pyloric third of the stomach. Ulceration in the cardiac third was very rare. In two of the cases there was a distinct history of previous perforation, and it was with difficulty that a sufficient portion of the stomach was cleared to allow the performance of gastroenterostomy. Fifteen patients were operated upon for hemorrhage; of these, one patient, aged 62 years, died. The other death occurring in the series of 100 cases was due to internal strangulation of the bowel caused by the small intestine passing through the opening made in the transverse mesocolon.

The symptoms of ulcer in these cases varied very much. In some the patients complained of little more than severe intractable dyspepsia. Vomiting was often inconspicuous as a symptom, and Moynihan thinks that its absence in many cases is due to the curtailment of diet which the patient usually makes. Vomiting was observed as of repeated occurrence

¹ Ann. of Surg., May, 1904.

in 44 cases. Hematemesis occurred in 21 cases besides those operated upon for hemorrhage. Melena was present alone in 3 cases, in all of which a duodenal ulcer was found. Hematemesis and melena were associated in 6 cases, in 4 of which gastric ulcers alone were found and in 2 both duodenal and gastric ulcers. Of all symptoms, pain was the most constant and most distressing. It appeared sometimes before a meal was finished, sometimes half or one hour afterward. A "hunger pain," being a pain eased by the taking of food and appearing 2 to 4 hours after the meal, was noticed in cases both of gastric and of duodenal ulcer and was always associated with hyperchlorhydria. In speaking of the cases operated upon for hemorrhage Moynihan states that several of the patients were in a desperate condition at the time of operation. In 5 of them saline intravenous infusions were employed. In these the hemoglobin percentage at the time of operation was 18, 22, 25, 28, and 33 respectively. In all the 15 cases gastroenterostomy alone, without excision of the ulcer, was performed. In none of them was there any evidence of renewed bleeding after operation. Moynihan repeats what he has stated before, that according to his observation distention of the stomach is the determining cause of a recurrence of the hemorrhage after it has spontaneously ceased, as it is apt to do in all cases of acute ulcer and in many of chronic ulcer. In all the cases he has operated upon for hemorrhage distention of the stomach has been observed, and in some it was phenomenal. The distention of the stomach causes a displacement of the clot and renewal of the hemorrhage. The question of treatment of gastric hemorrhage is still unsettled, but Moynihan's feeling is that gastroenterostomy should always be performed whether or not the ulcer is excised, and he submits his own cases as evidence that this operation alone is sufficient to prevent further bleeding. Regurgitant vomiting after operation was observed in 3 patients. In one the vomiting ceased on the tenth day, after the stomach had been washed out once; in another, the painless vomiting of bile continued for nearly a year. In the third case when the vomiting developed Moynihan felt sure that it was due to a kinking of the proximal loop of the small intestine, and therefore opened the abdomen 54 hours after the first operation and performed enteroanastomosis. After the second operation there was no vomiting. In this case the first operation was performed with great difficulty, owing to extensive adhesions, the result of a previous perforated ulcer. Although it has been supposed by some that the presence of bile and pancreatic juice in the stomach was the exciting cause of vomiting after gastroenterostomy, a case is mentioned in which, owing to a complete rupture of the intestine at the duodenojejunal flexure, the duodenal end of the bowel was closed and the distal end implanted in the stomach, and yet in this case digestion was not interfered with and the patient made a good recovery in spite of the fact that all the bile and pancreatic juice passed into the stomach. Moynihan believes with Mayo that the most frequent cause for postoperative vomiting in these cases is due to the fact that the anastomosis is not made at the most dependent portion of the stomach, and urges that the bowel should be

attached as near the greater curvature as possible. In other cases an acute kinking of the bowel at the point of the anastomosis may produce the vomiting.

Gastric tetany was observed in 5 of the cases of the present series. In 3 it was slight and affected only the hands, forearm, and calf muscles. In the other 2 patients the muscles of the neck and abdomen were affected and the patients suffered the utmost agony. Whatever the cause of gastric tetany may prove to be, Moynihan has no doubt that the disease in its severer forms is a complication of old-standing dilation of the stomach and can be prevented by the early performance of gastroenterostomy. Lung complications were noted in 3 cases; in one there was an attack of pneumonia and in 2 acute bronchitis. The symptoms began about the end of the second or third day. It is believed that pneumonia occurring in these cases is septic in origin and is due in most instances to the inhalation of putrid material from carious or unclean teeth. With this idea, it is now Moynihan's custom to follow out the advice of Cushing, that in preparing a patient for operation upon the stomach the greatest care should be given to the cleansing of the teeth and mouth. After operation the patient is placed in a semirecumbent position. If the need of food is very urgent, fluid nourishment is given at once in small doses; otherwise saline enemias are given every 4 hours.

In the reported series of cases the anterior operation of Wölfler was performed 5 times, the operation of von Hacker 94 times, and Roux's operation in one case. The latter operation is particularly indicated in cases in which adhesions interfere with the performance of the von Hacker operation. The only objection that can be raised to Roux's operation (which is an ideal method) is that it takes about 10 minutes longer than ordinary posterior gastroenterostomy. In 92 of the cases the result of the operation was perfectly satisfactory from the first and improvement was very prompt. Of the remaining 6 cases, in all of them hyperchlorhydria was pronounced before the operation and proved a source of pain and inconvenience afterward. Three greatly improved under medical treatment, one is almost well, and 2 are still under treatment. The last 3 were all operated upon within 8 months. Moynihan states that where hyperchlorhydria is present as a prominent and enduring symptom some preliminary treatment by diet and alkalis is desirable. Reference is made to the difficulty frequently incurred in differentiating inflammatory induration about an ulcer from malignant disease, cases being mentioned in which each of these conditions had been mistaken for the other. Moynihan believes now, however, that he is able to differentiate between them.

A review of 303 operations upon the stomach and first portion of the duodenum, with a tabulated report of 313 operated cases, is reported by William J. Mayo.¹ The average age was 42; males, 42 %; females, 58 %. Of duodenal cases, there were 26 with 2 deaths. Ulcer limited to the duodenum was found 11 times. These were divided as follows: one acute perforating, 2 chronic perforating, 5 active, and 3

¹ Ann. of Surg., July, 1903.

cicatricial contraction with obstructive symptoms. One patient died from pneumonia following excision of the ulcer, one from exhaustion after gastroenterostomy. Five times ulcer existed both in the duodenum and stomach. Five of the operations on the duodenum were due to gallstone perforation; there were no deaths in this group. In no instance was the duodenum the seat of primary malignant disease, and in but 2 cases was there any evidence of extension from pyloric cancer, and then it was not marked. A diagnosis of lesions originating in the duodenum was made in 2 cases prior to operation. The experience of Mayo leads him to believe that surgical diseases of the duodenum are much more frequent than has been thought. In the 277 cases of operation upon the stomach there were 28 deaths. There were 168 benign cases, with 11 deaths. The majority of these operations were for chronic ulcer and its late cicatricial results. In referring to the cause of gastric ulcer Mayo believes that perverted stomach secretion is the most important manifestation in the majority of cases. This is borne out by the almost constant association of extensive secretion and the fact that similar ulcers in the duodenum occur in the first portion and not in that which is protected by the alkaline juices poured through the common duct. Another fact bearing on this point is the occurrence of ulcer of the jejunum after gastroenterostomy. Mayo makes the following clinical classification of gastric ulcers: "(1) Round and fissure ulcers—(a) acute, (b) chronic. They have the distinguishing feature that there is but little thickening about the base of the ulcer. Many amount to little more than a fissure, and are closely associated with group 2. (2) Mucous erosions; a condition which must be accepted with caution. (3) Chronic ulcer with a thickened base and usually irregular in form, probably an extensive variety of the chronic round ulcer. (4) Benign obstructions without regard to cause, although usually of inflammatory origin." The last two varieties are most frequently met. Operation in the acute cases is usually called for by the occurrence of perforation or severe hemorrhage. Chronic round ulcer is found most commonly in adults, and in Mayo's experience has been more frequent in females than in males. The mucous "erosion" limited to a small area or several such patches were seen in a few instances. The exact nature of the ulcer is not usually ascertained, because clinical experience has demonstrated that drainage is the best method of surgical treatment, and therefore an exploration of the interior of the stomach, however attractive to the surgeon from a diagnostic point of view, is hardly warranted. If round ulcer is found, excision is the proper course, but there is always the chance that the ulcer excised is not the only one and that the others may exist in inaccessible situations. The so-called "chronic ulcer" of Robson is large and irregular in outline and has a thickened base, in this respect differing from the chronic round or fissure ulcer. It is thought that probably the difference is merely one of degree, the latter being the forerunner of the large irregular ulcer. The majority of the operations recorded here were for thick-based chronic ulcer and its late results. As a rule, the ulcer was found near the lesser curvature and not infrequently at the pylorus.

The posterior wall was affected more often than the anterior. In the duodenum the anterior wall was most often the seat of ulceration. The youngest patient was a girl of 17 and the oldest a man of 64. An interesting fact is that in 60 % of the malignant cases a previous history of ulcer was obtained. In 2 instances malignant degeneration of the margin of the ulcer was demonstrated. Conditions favorable for the excision of the ulcer were met in only 3 cases. As a means of locating the ulcer Mayo has found the suggestion of Lund of the greatest advantage. Lund pointed out that the enlarged lymph-nodes in either the lesser or greater omentums may lead to the ulcer. In all the ulcers of every description met by Mayo the upper 2 inches of the duodenum, pylorus, pyloric antrum, and that part of the stomach lying to the right of a line drawn downward from the esophagus was the seat of disease, and in only a few instances of extensive hourglass contraction did the ulcer extend to the left of this line. Ulcers do occur in all parts of the stomach, but it is doubted whether when situated in the cardiac end they cause chronic symptoms calling for operation. Twelve chronic dilations of the stomach without ulcer or obstruction were operated upon. In these cases the stomach-wall was of normal or increased thickness, and in more than half of the cases the dilation resulted from a high-lying but unstenosed pylorus. Simple gastropotosis is not considered a sufficient indication for operation. In 3 cases, however, in which exploration revealed this condition, shortening of the gastrohepatic ligament after the method of Beyer was done. "Cancer of the stomach, 109 cases, 17 deaths—15.6 %. Late diagnosis and cachexia made the aspect of this group discouraging. Palliative operations predominate with considerable immediate mortality and no great prolongation of life. The hope of the future lies in early exploratory incision, and the necessity for this depends upon clinical observation rather than laboratory methods, which too often only become valuable when the extent of the disease is beyond cure. Given a patient of middle or later life who begins to lose flesh and appetite and suffer from indigestion without apparent cause, the possibility of cancer should be considered; and if the source of the symptoms cannot be shown within a few weeks, the situation should be explained to the patient, and the choice between exploration and procrastination allowed him."

In discussing the operation for gastric cancer attention is directed particularly to the blood and lymphatic supply of the stomach. Robson has pointed out that the dome of the stomach has no lymphatic channels and few lymphatic glands; therefore if all the stomach except this portion be removed, the remaining part will be adequately nourished by the cardiac branches of the gastric artery and by the vasa brevia given off from the splenic artery. Excision of all the stomach lying below and to the right of a line drawn between the gastric artery and left gastroepiploic vessels is the logical operation. [See later article by Mayo.] One reason that only 5 % to 8 % of gastric cancers have been cured by extirpation is that a part of the organ has been retained in which the vascular and lymphatic connections with the diseased area have not

only been close but direct. [The operation here described by Mayo for gastric cancer is omitted in view of his later paper dealing with the same subject.] The advantage of removing the greater portion of the lesser curvature is open to debate, owing to the fact that Cuneo has demonstrated that the lymph-current along the greater curvature is from left to right, and that in pyloric cancer not only is there comparatively little tendency to lymphatic involvement in this region, but that it is confined to the glands in the immediate vicinity of the growth and does not extend to the left of the pyloric portion. Hartmann's line of excision may therefore be preferred in cases of pyloric cancer, and his operation is much easier than the one employed by Mayo. In 8 cases operated upon by this radical method there were 3 deaths, while in 18 remaining cases operated upon by various methods, from simple pylorotomy to the operation of Hartmann, there were but 2 deaths. One patient lived 3 years and 7 months before recurrence. Several are alive and well over 2 years, and the general average has been over a year. It is surprising how few of those recovering from the operation have failed to live a year or more.

The latter part of Mayo's paper is taken up with the discussion of the various methods of improving stomach-drainage. In the present series of cases 19 were subjected to pyloroplasty by the Heineke-Mikulicz method, 6 of which came to secondary gastrojejunostomy because of failure of the operation to drain the stomach adequately. The other patients remained well. There were no deaths in this series. The objection to the operation is that although it helps the obstruction at the pylorus, it does little to overcome the greatly dilated stomach with its overstretched and degenerated musculature, which renders it unable to elevate the food to the pylorus. "Gastroenterostomy was done 168 times, divided as follows: Gastrojejunostomy, 121; gastroduodenostomy after Finney, 26; independent gastrojejunostomies in connection with pylorotomy and gastrectomy, 22. Of the 121 cases of gastrojejunostomy made purely for drainage purposes, there were 17 deaths. The percentage of mortality in the benign cases was 8, in the malignant, 30; the great mortality of the latter being due to the choice of favorable cases for radical operation, the hopelessly advanced and cachectic coming to gastroenterostomy, and, could the condition have been known beforehand, an operation would not have been undertaken in some of these cases." Gastrojejunostomy for benign obstruction of the pylorus is one of the most satisfactory operations with which Mayo is acquainted. If the opening is made at the bottom of the stomach pouch at or near the greater curvature, regurgitant vomiting will not take place and entero-anastomosis is unnecessary. If a feeling of obstruction or actual vomiting after operation takes place, gentle stomach lavage should be practised. Gastrojejunostomy if the pylorus is unobstructed is far more satisfactory. In these cases the new opening nearly invariably contracts. When done for ulcer without pyloric stenosis, the operation results in temporary healing of the ulcer, but with contraction of the new opening, the ulcer-producing causes are again reëstablished and recur-

rence is apt to take place. In 28 cases of gastrojejunostomy with open pylorus 8 came to secondary operation from contraction of the gastrointestinal opening, while in all cases with permanent obstruction at the pylorus there were no cases of secondary operation from this cause. Mayo, in order to avoid a recurrence in these cases, has performed various methods of closure of the pylorus with satisfaction. The operation of Finney, gastroduodenostomy, is especially adapted to those cases in which there is little disease about the pylorus. If desired, excision of the neighboring ulcer can easily be combined with it. It is less suitable, however, where there is extensive involvement of the pylorus, but it is in just this class of cases that gastrojejunostomy gives its best results.



Fig. 6.—Showing the posterior wall of the stomach projecting through the rent in the transverse mesocolon (B. G. A. Moynihan, in *Practitioner*, February, 1904).

B. G. A. Moynihan¹ describes a simple method of performing gastroenterostomy and other abdominal anastomoses. After the abdomen is opened, the under surface of the transverse mesocolon is exposed and the vascular arch, formed mainly by the middle colic artery, is seen. "A bloodless spot is chosen, a small incision made in the mesocolon, and the finger passed into the lesser sac. The opening in the mesocolon is then gradually enlarged by stretching and tearing, until the fingers can be passed through it (Fig. 6). The hand of an assistant now makes the posterior surface of the stomach present at this opening, and the surgeon grasps the stomach and pulls it well through. A fold of the stomach, about 3 inches in length, is now seized with a clamp

¹ *Practitioner*, Feb., 1904.

whose blades are sheathed in rubber tubing. The clamp is applied in such a way that the portion of the stomach embraced by it extends from the greater curvature obliquely upward to the lesser curvature toward the cardia (Fig. 7). It is important that the point on the greater curvature held by the clamp should be the lowest point. This is made certain before the stomach is turned over to reach its posterior surface, by observing that point which lies lowest in the abdomen. When the posterior surface is exposed, special care is taken that this lowest point is fixed in the end of the clamp. The duodenojejunal angle is now sought, and readily found by sweeping the finger along the under surface of the root of the transverse mesocolon to the left of the spine. The



Fig. 7.—Showing the oblique application of the clamp to the stomach (B. C. A. Moynihan, in *Practitioner*, February, 1904).

jejunum is then brought to the surface, and a portion of it, about 7 or 8 inches from the angle, is fixed in a second pair of clamps. The two clamps now lie side by side on the abdominal wall, and the portions of stomach and jejunum to be anastomosed are well outside the abdomen, embraced by the clamps. The stomach, with the exception of the part embraced by the clamp, is returned to the abdomen through the upper part of the incision. The whole operation-area is now covered with gauze wrung out of hot sterile salt-solution, the clamps, with the stomach and jejunum which they embrace, alone being visible outside the abdomen. A continuous suture is then introduced, uniting the serous and subserous coats of the stomach and jejunum (Fig. 8). The stitch is commenced at the left end of the portions of gut inclosed in the clamp,

and ends at the right. The length of the sutured line should be at least 2 inches; its average length is $2\frac{1}{4}$ or 3 inches. In front of this line an incision is now made into the stomach and jejunum, the serous and muscular layers of each being carefully divided until the mucous membrane is reached. As the cut is made, the serous coat retracts and the mucous layer pouts into the incision. The cut edge of the serous coat is loosened all around from the underlying mucosa. An ellipse of the

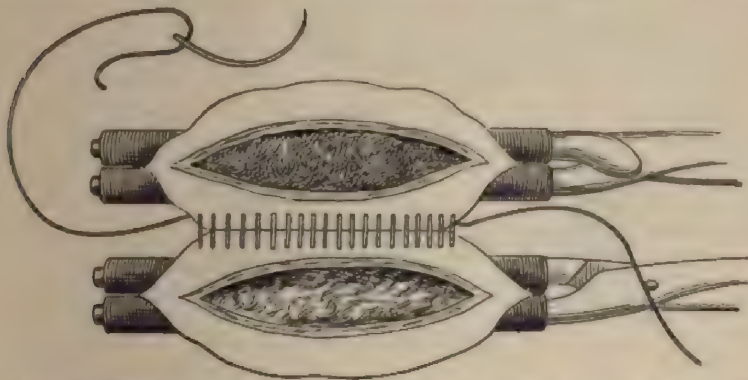


Fig. 8.—Clamps side by side; the first line of suture (B. G. A. Moynihan, in *Practitioner*, February, 1904).

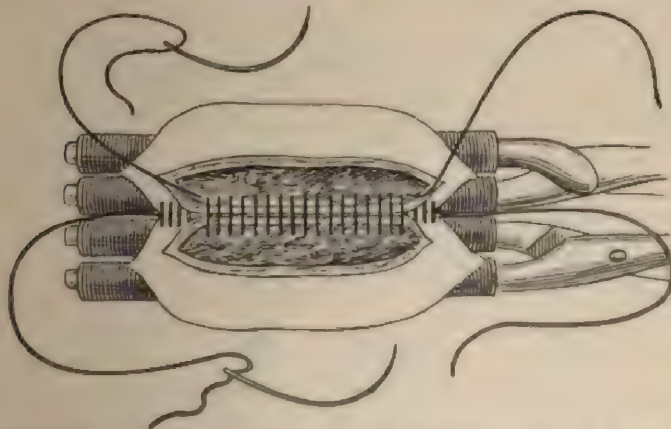


Fig. 9.—The stomach and jejunum opened; the inner, hemostatic suture (B. G. A. Moynihan, in *Practitioner*, February, 1904).

mucous membrane is now excised from both stomach and jejunum, the portion removed being about $1\frac{1}{4}$ or 2 inches in length, and rather more than half an inch in breadth at the center. The gastric mucosa shows a marked tendency to retract; it is therefore seized with a pair of miniature (French) vulsella on each side. No vessels are ligated, as a rule. The cut surface of the bowel and stomach may occasionally ooze slightly; this can be checked at once by tightening the clamps one

notch. The inner suture is now introduced (Fig. 9). It embraces all the coats of the stomach and jejunum, and the individual stitches are placed close together and drawn fairly tight, so as to constrict all vessels in the cut edges. The suture begins at the same point as the outer one, and is continued without interruption all around the incision to the starting-point, where the ends are tied and cut short (Fig. 10). It will be

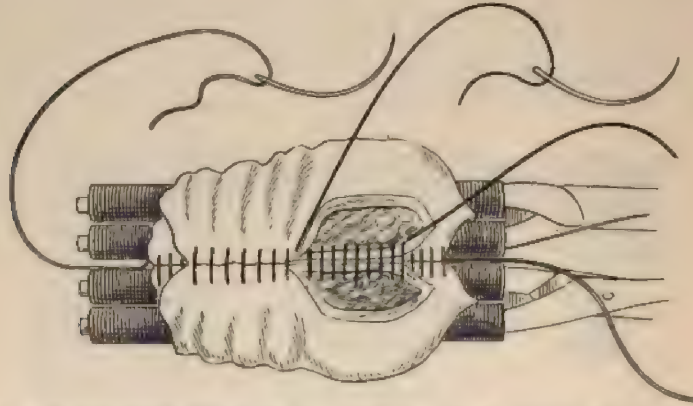


Fig. 10.—Inner suture complete (B. G. A. Moynihan, in *Practitioner*, February, 1904).

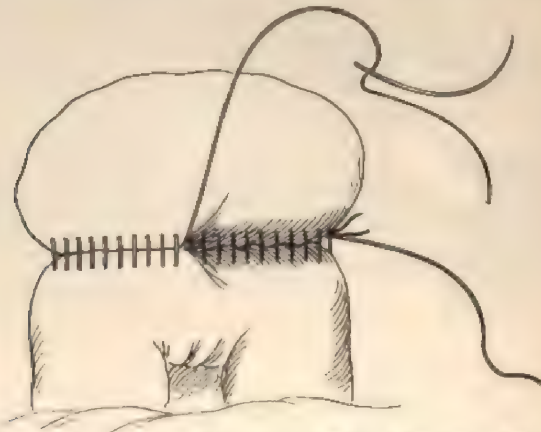


Fig. 11.—Clamps removed; completion of outer suture (B. G. A. Moynihan, in *Practitioner*, February, 1904).

found that there is no need to interrupt the stitch at any point, for there is no tendency on the part of the sutured edges to pucker when the stitch is drawn tight. The clamps are now removed from both the stomach and the jejunum, in order to see if any bleeding point is made manifest. Very rarely—about once in 10 cases—a separate stitch at a bleeding point is necessary. The outer suture is now resumed, and continued around to its starting-point (Fig. 11), being taken through the serous coat about $\frac{1}{4}$

of an inch in front of the inner suture. This outer stitch is also continuous throughout; when completed, the ends are tied and cut short, as with the inner stitch. There are thus two suture-lines surrounding the anastomotic opening: an inner, hemostatic, which includes all the layers of the gut; and an outer, approximating, which takes up only the serous and subserous coats.¹ For both stitches Moynihan uses thin Pagenstecher thread. The needle used is of a special pattern, being rather more than half a circle and having a slot-eye for easy threading. "In introducing the stitches it will be found a great advantage to draw lightly upon the thread between the needle and the last stitch. A little ridge is thus raised up both in the stomach and in the intestine, and into these ridges the needle passes quite readily. There is then no need to dip down, as it were, to pick up the gut on the point of the needle. No sutures are passed through the mesocolon and stomach. The gut is lightly wiped over with a swab, wet in sterile salt-solution; the stomach and omentum are lifted out of the upper part of the wound, and replaced within the abdomen in their normal positions." This same technic may be adapted to any intestinal anastomosis. [We have employed the method described by Moynihan in a number of instances, with the most gratifying results. The technic is simple and easily followed. The whole operation requires from 30 to 40 minutes.]

J. Basil Hall¹ adds 8 cases of **gastroenterostomy** to the 4 he previously reported,² in which he employed a **new route for posterior gastrojejunostomy**. The operation, which has already been described in detail, consists in anastomosing the jejunum to the posterior wall of the stomach, the access to the latter organ being obtained through the gastrocolic omentum instead of through the mesocolon, as is usually done. In perforating the gastrocolic omentum there is no fear of interference with the vascular supply of any part of the bowel, as is the case in perforation of the transverse mesocolon. When the stomach is small and fixed, it is often difficult to get at the posterior wall through the mesocolon, and it is especially in these cases that the advantage of the supracolic route is most striking. Hall does not believe that there is any disadvantage in bringing the loop of jejunum up in front of the colon. He has had two opportunities of examining subjects postmortem on whom gastrojejunostomy had been performed by this method for malignant disease, and in neither was there any evidence of compression of the loop nor was he able to produce this by inflation of the colon with gas. Of the 4 cases reported last year, 3 are alive and well; the fourth is dead from extensive carcinoma. A table with the additional 8 cases is presented. Hall claims for this operation the advantages of both the anterior and the posterior operation, while avoiding their disadvantages.

Brodnitz³ reports a case of **peptic ulcer** occurring in the jejunum after gastroenterostomy. He has been able to collect only 14 cases of peptic ulcer resulting after gastroenterostomy. The following are his conclusions: "(1) Up to the present time peptic ulcer has only been

¹ Brit. Med. Jour., Oct. 10, 1903.

² See YEAR-BOOK, 1904.

³ Proc. German Surg. Cong., 1903; Ann. of Surg., Dec., 1903.

observed after gastroenterostomies for benign affections. (2) It occurs indifferently in cases of hyperacidity and normal and subnormal acidity. (3) It may follow either anterior or posterior gastroenterostomy. The anterior operation gives greater protection against perforative peritonitis. (4) Peptic ulcer often runs its course without symptoms; at other times there are nightly pains. (5) In half of the recoveries a recurrence of the ulcer has been observed, hence an unknown individual disposition may be assumed."

John Rogers, Jr.,¹ in discussing the **present status of gastroenterostomy**, shows a marked preference for the operation described by Petersen. This operation has been done in Czerny's clinic 215 times in benign cases, with 10 deaths. "To perform the operation, after opening the abdomen by a median 4-inch incision just above the umbilicus, the position of the greater curvature is noted. The transverse colon and omentum are turned up on the thorax, and the posterior surface of the stomach is exposed by tearing through a portion of the mesocolon, which is free from vessels. An area about 2 inches square is thus exposed, and attached at its margin by 4 Lembert stitches to the edges of the rent. The plica duodenojejunalis is then felt for and seen, and, while the gut is held up perpendicularly to the spine, it is attached from 2 to 4 inches below its origin by a row of Lembert sutures placed transversely to the long axis of the gut, around one-half the circumference of its free border to the opposite exposed posterior stomach-wall. The ends of the first and last stitches are left long as guides. In front of this the stomach and gut are opened, and the cut edges sutured or a Murphy button is inserted. The long guide and end stitches behind are then used as starting-points for another row of Lembert stitches to close off the fistula. The omentum and transverse colon are replaced and the abdomen closed. The jejunum is thus anastomosed in its normal position, and without any twists, to the adjoining posterior stomach-wall. There is no loop to become occluded, and no chance for volvulus or hernia above it. In Czerny's clinic the Murphy button, supplemented by a ring of Lembert sutures outside, has generally been employed." The retention of the button in the stomach may be avoided by the employment of Hildebrand's or Weir's modification of this instrument. Rogers reports 5 cases. In 4 of them the operation just described gave the most satisfactory results. One patient died because of ascending infection from the urinary tract.

A. W. Mayo Robson² presents an article on **hourglass stomach** based on a personal experience of 23 cases, brief histories of which are included. Although admitting the occasional occurrence of congenital hourglass stomach, Robson states that in an experience of over 1000 operations on the upper abdomen in which the stomach could be seen and examined, and about 400 of which have been done on the stomach itself, he has not met with a single case of congenital hourglass constriction. The early symptoms depend entirely upon the cause, whether it be ulcer, cancer, or perigastritis; later, however, they are more significant. "The symptoms are for the most part pain after food, vomiting, sometimes of

¹ Ann. of Surg., Apr., 1904.

² Lancet, Jan. 2, 1904.

blood, and great wasting. In a number of cases tumor develops, owing to the enormous thickening which occurs around a chronic ulcer, and so marked has this tumor occasionally been that some of my patients have been sent with the idea that they had cancer, and even when the abdomen has been opened it is not always easy to say that the case is simple and not malignant. The well-known fact that cancer not infrequently supervenes on chronic ulcer adds to the difficulty, but when the abdomen is opened it will be found, as a rule, that the glands in ulcer are discrete and rounded and the tumor is not nodular or craggy, nor are any secondary nodules seen on the surface of the stomach or in the liver; moreover, ascites is absent. As a rule, dilation of the proximal pouch, when the cause is ulcer, leads to symptoms simulating dilation from pyloric stenosis. In several of my cases the patients have been conscious of fluid passing from one cavity to the other with an audible gurgle or murmur, and in one case, with the stethoscope over the epigastrium, I was able to hear the passage of the stomach-contents through the strictured part, on alternately compressing each side of the abdomen. In several cases, on distending the stomach with carbon dioxid, the proximal cavity first became distended and afterward both cavities became outlined with a sulcus between." Another distinctive sign is the following: On washing out the stomach until the fluid returns clear, suddenly, without any warning, the next lavage immediately afterward may return foul, owing to the second cavity having regurgitated its contents into the proximal clean one; or the second cavity discharges foul material by the side of the tube which has the moment before been evacuating clear fluid. A sign pointed out by Wölfler is that on washing out the stomach the fluid may entirely disappear and cannot be made to return through the tube, the reason being that it has passed straight through into the second pouch. The distinctive symptoms will depend upon the position of the constriction. In the majority of Robson's cases the constriction has been about 4 inches from the pylorus, and in nearly all the cases the proximal cavity was the larger. When the narrowing is in the center of the stomach, gastropasty is a most efficient procedure, and in all the cases in which Robson has performed that operation alone, the patients have recovered and have remained healthy. In performing gastropasty the first principle to be borne in mind is to make the opening sufficiently large to secure union of the edges without tension. If the ulceration has not produced extreme contraction and the second pouch is not very prominent, posterior gastroenterostomy may be the operation of choice, and it has answered quite well in the 6 patients on whom Robson has employed it, but his experience would lead him not to advise the anterior operation in these cases. When the two cavities are equally dilated or connected by a very long stricture, an anastomosis may be made between the two cavities so as to short-circuit the stricture by the operation known as gastrogastrostomy, but if there is active ulceration going on or the pylorus is stenosed, he would at the same time recommend posterior gastroenterostomy. Attention is called to the fact that the mistake of attaching the bowel to the distal pouch has been made. In cases of

cancer causing hourglass contraction two procedures are open to the surgeon—either the performance of gastrectomy or gastroenterostomy. Of Robson's 23 cases, 19 were simple and 4 were malignant. "Of the simple cases, 11 were operated on by gastroplasty alone and all the patients recovered; one by gastroplasty and pyloroplasty combined, the patient dying, as did the one in whom anterior gastroenterostomy was performed. Of the 6 patients treated by posterior gastroenterostomy, all recovered. Of the 4 cases of cancerous hourglass stomach, 3 patients recovered, 2 of the cases being treated by partial gastrectomy."

B. G. A. Moynihan¹ also discusses **hourglass stomach** and reports 18 cases, 16 the result of ulcer or perigastric adhesions and 2 the result of malignant disease. A strong argument is made against the existence of congenital hourglass contraction. Moynihan believes that the supposed characteristic muscular arrangement described as occurring in congenital cases is clearly the result of an ulcer whose edges are immensely thickened and whose base is perforated. The idea that this condition is always congenital has become so prevalent that authors frequently speak of it as congenital and then describe a healed or an unhealed ulcer at the site of constriction. The absence of any observation of hourglass stomach in the fetus or the young child is offered as a strong argument against its occurrence. After a careful examination of a number of specimens and an earnest search through the literature, Moynihan does not believe that there is such a thing as congenital hourglass contraction. He describes the symptoms of this condition and briefly reports his cases.

Elder² (Montreal) reports a second **case of hourglass stomach**. The patient had been under his care since the beginning of her gastric trouble, 12 years previous. An exact knowledge of the patient's previous symptoms, together with a history of a mass to the left of the median line, a mass which gradually enlarged during the day and which disappeared during the night, but which could be made to reappear by dilation of the stomach, rendered the diagnosis of hourglass stomach probable. When the abdomen was opened, the constriction was found to be nearer the cardia than the pylorus. This condition accounted for the rapid loss of weight which had lately taken place. Gastroplasty was performed and the patient made an excellent recovery.

A case of **hourglass stomach** is reported by Brook,³ which he believes to be undoubtedly one of congenital origin, as there was absolutely no adhesion about the constricted portion externally and the mucous membrane throughout was soft and velvety. Moynihan, in a communication to the *British Medical Journal*,⁴ states that this case furnishes the strongest evidences of the existence of this deformity as a congenital condition that he has seen.

T. Crisp English⁵ makes a valuable contribution to the literature of **perforated gastric ulcers** in a discussion of 50 consecutive cases of gastric and duodenal ulcers operated upon in St. George's Hospital.

¹ Brit. Med. Jour., Feb. 20, 1904.

² Ann. of Surg., Oct., 1903.

³ Brit. Med. Jour., May 7, 1904.

⁴ May 28, 1904.

⁵ Med.-Chir. Trans., 1903, lxxxvii.

These constitute all the cases operated upon in this hospital, and the operations were performed by a number of different surgeons. Of these 50 consecutive cases, the stomach was the seat of perforation in 42 and the duodenum in 8 cases. Of the gastric perforations, 33 occurred in females and 9 in males. Of these patients, 52% recovered after operation. Of the duodenal perforations, 2 occurred in females and 6 in males, the average age being 34½ years. Two of the duodenal cases recovered, or 25%. The first operation of this kind at St. George's Hospital was done in December, 1892. Out of the first 10 cases operated upon, 3 recovered; while of the 7 cases admitted during 1903, 6 recovered. This improvement in the recovery rate is attributed to earlier recognition of the condition and earlier operation, and to greater care in the cleansing of the peritoneal cavity. The first successful case was operated upon in April, 1894. In endeavoring to decide the question of premonitory symptoms, the previous history and the symptoms immediately preceding operation were studied in all the cases. In 5 there was no history of previous gastric trouble; in 34 there had been definite dyspepsia or gastric ulceration; hematemesis occurred in 8 of these cases. In 6 cases, although there had been dyspepsia, it had not existed for some time before perforation. In 5 instances no information could be obtained. The result of this investigation, therefore, is that in 22% of the cases the symptoms had been completely latent before the actual rupture, and in many of the others the dyspepsia had been of the slight nature not requiring any serious medical treatment. In 10 of the cases just before operation there was a progressive increase of pain and vomiting for a short period, varying from a few hours to 2 or 3 days. In one case hematemesis had occurred 4 times in the preceding 3 weeks. In the great majority of the cases the onset was sudden and without warning. The comparative rareness of hematemesis as a precursor of perforation is attributed to the fact that patients recovering from gastric hemorrhage usually receive careful treatment. In but 2 of the cases did perforation take place during the menstrual period, and English is not prepared to say that perforation is more likely to occur at this time, although hematemesis is undoubtedly more frequent just before the onset of menstruation. Three of the reported cases perforated while in the hospital under treatment for gastric ulcer. One of these was a man 48 years of age, who died on the fifteenth day after operation for perforated gastric ulcer, but at the autopsy it was shown that death resulted from perforation of the gastroduodenal artery by a gastric ulcer. Another of these patients was a man 63 years of age, who was supposed to be the subject of carcinoma of the pylorus. The following is English's conclusion regarding premonitory symptoms: "Premonitory symptoms are most likely to occur in cases of chronic and marked ulceration; such symptoms are progressive, increase in discomfort and pain after taking food of any kind, greater frequency of vomiting, and increase of the surface and deep tenderness in the epigastrium. When such conditions are found, active and deep ulceration with the danger of perforation should at once be suspected, and no food of any kind should be adminis-

tered by the mouth. The patient should be kept quiet in bed, and morphin especially should be avoided, owing to the danger of masking the symptoms of perforation, should this occur." In dealing with the symptoms of perforation English states that the severity of the initial pain is most constant and highly characteristic, and that this sudden, terrible, and intolerable pain is rarely met in any other condition. The situation of the pain is no guide to the situation of the lesion. In perforations of the stomach the pain is often most intense in the lower portion of the abdomen, owing to the extravasation of the stomach-contents to this point. It is well known that in many cases of perforated duodenal ulcer the pain and tenderness are most marked in the right iliac fossa, simulating very closely acute appendicitis. The intensity of the collapse bears a fairly constant relation to the size of the perforation. In the present series vomiting occurred in 37 cases, was absent in 10, and was not mentioned in 3. Generally speaking, it occurred usually after perforation in the majority of cases, and did not recur after the first few hours. Further, it was noted that in the fatal cases in which vomiting had been absent for some hours before operation it reappeared and persisted after recovery from the anesthesia. The degree of reaction after the primary collapse varied, but was often well marked, and then latency of symptoms formed a prominent feature. With the recovery from collapse the pain subsided, the vomiting ceased, and 2 of the patients were able to walk into the hospital with their peritoneal cavities bathed in gastric contents. In some of the cases both the pulse and the temperature became normal during this quiescent period. If the patient is first seen in this stage, as frequently happens, a fatal mistake may be made. Two cases illustrating complete reaction from collapse are detailed.

The effect of stimulants in producing temporary improvement in the patient's condition and in masking the gravity of the case is frequently noted. English shows that although the area of hepatic dullness was studied in each of the cases, it is of comparatively little value and likely to mislead if relied upon. The condition of the liver dullness was definitely stated in 43 of the present cases. It was normal in 11, absent in 12, and diminished in 20. It is also stated that the extent of gastric resonance is of no diagnostic value. An interesting point mentioned by English is the fact that in 2 cases sweating, though present over other parts, was more intense by far over the epigastrium. A diagram is presented showing the situation of the perforations, and it indicates that perforation is more likely to take place in ulcers situated close to the lesser curvature and is rather more frequent toward the cardiac than the pyloric end of the stomach. Five of the ulcers occurred on the posterior wall, close to the pylorus. In these cases the perforations were usually large and the gastric contents escaped through the foramen of Winslow into the greater peritoneal cavity. The 8 duodenal perforations all occurred in the first portion of the duodenum, 6 on the anterior wall and 2 on the upper and posterior wall. The possibility of saving life even in the most desperate cases is illustrated by a case in which a perforated

gastric ulcer was successfully treated 72 hours after the onset of symptoms and in spite of intense general peritonitis.

Among the postoperative complications mentioned parotitis and pleurisy are most frequent: the former occurred in 5 cases and the latter in 15. Thrombosis occurred in 3 cases. All the symptoms and physical signs of perforation may be present and yet the stomach be found intact when the abdomen is opened. English has known of 7 such cases, all occurring in young females with histories of gastric trouble. In 3 of the cases no abnormality of any kind was discovered. In one of the cases the symptoms were due apparently to the rupture of a small ovarian cyst. In 2 instances the patients died after operation. In one the abdomen was found full of an odorless, turbid serum, the origin of which could not be discovered, and no autopsy was performed. The other was a case of acute appendicitis with general peritonitis in a young dyspeptic girl in whom all the physical signs were most intense in the epigastric region. In 4 of the duodenal perforations the condition so closely resembled appendicitis that the primary incision was made over the appendix region. In 2 of the 3 cases in which there was no intraabdominal lesion the symptoms occurred usually before the onset of the menstrual period; the symptoms cleared up with the onset of menstruation. In 13 of the 21 cases in which autopsies were performed other peptic ulcers were present. In 2 instances 4 ulcers were present in addition to the one which had perforated. Their most common situation was exactly opposite the perforated ulcer. In no instance was there a double perforation.

As regards the technic, in 31 cases general irrigation of the peritoneal cavity was employed; in 9, local irrigation; and in the remaining, sponging only was relied upon. With each of the 3 methods the mortality was the same, viz., about 50 %. It is noted in the study of this series of cases that there is an increasing tendency to dispense with drainage. In one case in which the perforation was deeply seated in the esophageal opening closure was impossible, owing to the friability of the surrounding tissue. In this case strips of gauze were passed down to the ulcer; no further escape of gastric contents occurred and an uneventful recovery followed. English concludes by stating the result of an interesting investigation into the after-condition of the patients recovering from operation, with the especial object of determining whether or not the symptoms of gastric ulcer recur after recovery by operation. Although it might seem wise in these cases of perforation to perform gastroenterostomy, the results do not warrant its practice in the presence of perforation. It was possible to trace 17 of the 24 patients who recovered, and the following is a summary of the reports of these cases: "In 11 cases there had been no return of gastric symptoms of any kind, and the patients had been quite well since operation. Two had married and had had children. In 4 cases dyspeptic symptoms were complained of, 2 being readmitted into hospital for short periods." In these cases, however, the symptoms were characteristic of dyspepsia and not of gastric ulcer. [This contribution is of especial value as it presents a large series of consecutive cases operated upon by a number of different men and extending over a

number of years, and deals with the subject in a very fair and thorough manner.]

St. Clair White¹ reports 5 consecutive cases of **perforative gastric ulcer treated by excision**. Each of the patients had presented symptoms of gastric ulcer for a year or more, and in each the evidences of perforation were unmistakable. The perforation occurred in the anterior wall in all the cases, and there was extensive fouling of the peritoneum, the stomach-contents in each having reached the pelvis. In but 3 of the cases was the normal hepatic percussion-note absent. The ulcer was excised and the resulting wound in the stomach closed by two rows of continuous sutures and strengthened by an omental graft. A vigorous and prolonged flushing with warm salt-solution was carried out for from 10 to 30 minutes, the entire peritoneal cavity being systematically gone over at least twice. A glass drainage-tube was inserted in the pelvis through a small suprapubic wound. Two of the cases died long after recovery from the immediate effects of the perforation and subsequent operation, and in each the death was the result of ulceration of the mucous membrane along the line of suture. One death occurred at the end of 6 weeks from multiple hepatic abscess secondary to a small collection of pus in the stomach. The other patient died 15 days after operation, after repeated attacks of profuse hematemesis. White believes that if the ulcer is easily accessible its excision should be part of the treatment.

A discussion of **perforated gastric and duodenal ulcers** is presented by John H. Gibbon,² who reports 4 cases operated upon. The symptoms of perforation depend upon whether the condition is acute, subacute, or chronic, and also upon the situation of the ulcer. Those of acute perforation are most characteristic, and their suddenness and severity make diagnosis easy. Often no history of gastric disturbance can be obtained or only a history of dyspepsia. In the acute cases the patient is probably able to explain that at the time of the onset of pain he felt as though something gave way in his abdomen. Pain is the predominant feature and may at first be confined to the upper abdomen, but later becomes general. Collapse varies greatly and frequent errors have occurred from supposing that this condition must always accompany perforation of a gastric ulcer. Acute perforation is more apt to occur in ulcers situated upon the anterior wall. In subacute perforation the symptoms develop less rapidly and are less severe. In this variety the opening is small or becomes partially occluded, or else the stomach is comparatively empty at the time of perforation. The resulting extravasation takes place slowly and usually gravitates to the right iliac fossa and the pelvis. In connection with the diagnosis Gibbon refers to a statement by Moynihan, that 3 cases have been operated upon for perforated gastric ulcer when the symptoms were due to impending menstruation. The subacute form and the perforations of the duodenum are frequently mistaken for appendicitis because of the slow extravasation into the pelvis and right iliac fossa. In 49 cases of perforated duodenal ulcer 18 were

¹ Brit. Med. Jour., Feb. 20, 1904.

² Amer. Med., Dec. 19, 1903.

diagnosed appendicitis (Moynihan). The case of duodenal perforation which Gibbon reports was operated upon as one of appendicitis, the true condition not being discovered until the abdomen was opened. This error, however, makes little difference, as two incisions are rather an advantage than a drawback, since the pelvis is probably filled with the stomach or intestinal contents and thorough drainage is necessary. Patients cannot be operated upon too early after perforation of the stomach or intestine. After finding the perforated ulcer and closing it, a careful search should be made for others, as double perforation is not uncommon. It is unnecessary to excise the ulcer. When the extravasation has been extensive, Gibbon orders extensive irrigation with thorough drainage through the upper wound and through an additional suprapubic wound. Many perforations can be avoided by the proper surgical treatment of chronic gastric ulcer. Of the cases reported, 3 were gastric and 1 was duodenal. Two of the patients recovered and 2 died. One of the patients who died was a man who had a typical acute perforation and was operated upon 33 hours later, when there had developed extensive peritonitis with distention of the abdomen and high temperature, sweating, etc. In this case a finger could be placed in the perforation. The patient died 12 hours after operation. In the other fatal case the patient died on the twenty-fourth day after operation from an accumulation of pus in the pelvis producing obstruction of the bowels. A second operation was performed in this case 6 days before death, for the purpose of relieving the obstruction and draining the pelvis. Both the other patients made excellent recoveries and have suffered from no further symptoms. These 4 cases were all operated upon within a period of 9 months.

W. Watson Cheyne and Haydock Wilbe¹ report a case of **perforated gastric ulcer** in a boy 13 years of age. The patient began to complain of some abdominal pain the day before he was seen by Wilbe. The second day he complained of violent pain in the abdomen which was worse about the umbilicus. He was collapsed and his pulse was 130. The abdomen was rigid and tender everywhere. There was no vomiting. Cheyne saw the patient the same evening, at which time the boy was extremely ill with evidences of perforative peritonitis. As the case was thought to be probably one of fulminating appendicitis, an incision was made over the appendix, and when the abdomen was opened, gas escaped. An appendix containing a large concretion was removed, but it was not thought to be the cause of the symptoms. A further exploration through a second incision revealed a perforation of the anterior wall of the stomach, one inch from the cardiac end. It was about the size of a small slate-pencil, and from it there escaped gastric juice and gas. It was a clean, punched-out opening and all the structures in the neighborhood seemed perfectly healthy. The ulcer was inverted and the patient ultimately recovered. One of the interesting points in the case was the patient's age—13 years. The authors have been unable to find any record of this condition in so young a patient. Still has recorded 5 examples of tuber-

¹ *Lancet*, June 11, 1904.

culous ulcers of the stomach in children, and in none of the cases were there any clinical symptoms associated with them. In one of the cases perforation had occurred, but extravasation had been prevented by adhesions. In the case just reported there was no sign whatever of tuberculosis about the stomach or the abdomen generally, nor was there any reason for suspecting it. [One of us (Da Costa) operated successfully upon a girl 16 years of age.]

Musser and Keen¹ record a case of **perforated gastric ulcer occurring in a woman 70 years of age** in which recovery followed closure of the opening and posterior gastroenterostomy. For one year the patient had been treated for gastric ulcer. The case was characterized by frequent profuse hemorrhages. One of these occurred on November 19 and was followed by a collapse. On November 26 at 9.30 a. m. the patient was suddenly seized with severe abdominal pain and developed symptoms of perforation. Keen operated at 3 p. m., 5½ hours after perforation. A small perforation was found in the middle of the pylorus anteriorly. The whole pylorus was thickened but not nodulated. The ulcer was inverted, the abdominal cavity, which contained considerable dark-colored fluid, was thoroughly flushed with salt-solution, and posterior gastroenterostomy was performed by means of a Murphy button. The patient was placed in bed in Fowler's position after the operation; her recovery was uninterrupted. Two months after the operation the button had not passed but had produced no trouble.

W. R. Boyd² (Melbourne) presents a discussion of the **diagnosis of perforative gastric ulcer from a physician's point of view**. The main points in the diagnosis are set forth as follows: "A history of previous gastric disturbance, *e. g.*, pain, dyspepsia, vomiting, hæmatemesis, and an attack of sudden intolerable pain, generally referred to the upper part of the abdomen, with some vomiting and symptoms of great shock. An early examination, before the administration of morphin and stimulants, will reveal a peculiar marked rigidity of the abdominal wall, with general abdominal tenderness, and sometimes diminution or even absence of liver dulness. It must be admitted that all the symptoms and physical signs of perforation may be present, and yet no perforation be found on opening the abdomen. Such cases have occurred, and will likely occur again, but they should not prevent us advising an exploratory incision in all grave but doubtful cases. With modern methods, it involves practically no risk, except to our diagnostic reputation." The mortality in cases treated medically is about 95 %. The mortality of cases treated by the surgeon is, according to recent records and Boyd's experience, not more than 50 %.

The **surgical treatment of perforative gastric ulcer** is presented by W. Moore,³ who states that it should be the rule always to operate at the earliest possible moment after a diagnosis has been made. The diagnosis must be made as well by the surgeon as by the physician. The incision

¹ Jour. Am. Med. Assoc., Mar. 12, 1904.

² Intercol. Med. Jour. of Australasia, Feb. 20, 1904.

³ Intercol. Med. Jour. of Australasia, Feb. 20, 1904.

should be in the median line, beginning at the ensiform. It is Moore's habit when the diagnosis is confirmed by this incision to make a second one below the umbilicus, introduce an irrigation tube, and have the fluid flow through the abdomen during the entire operation. In order to deal effectively with an opening in the posterior wall of the stomach it is necessary to make a transverse incision from the middle line through the left rectus muscle. Theoretically it would seem best to excise the ulcer. The results, however, from simple inversion have been so good as to cause Moore to believe that excision is unnecessary. When it is difficult to close the perforation, an omental graft may be employed. Thorough irrigation and drainage are both advised. If Moore's plan is followed when the surgeon is ready to close his wound, there will have been a constant stream of salt-solution flowing into the abdomen through the lower wound during the entire time of the operation. This is a time-saving measure. Although drainage is necessary, it is remarkable how quickly it can be dispensed with; a drainage-tube extending down into the pelvis can be removed in 48 hours. The gauze in the upper wound is removed gradually until no more is left at the end of about a week.

Keays¹ reports a case of **double perforating gastric ulcer**. The patient was a girl 16 years of age who died before medical aid was secured. The history, however, was that of a perforated gastric ulcer. At the necropsy a perforated ulcer was found in the anterior wall near the cardia, and a second one on the posterior wall directly opposite the first. This case goes to show the importance of carefully examining the whole stomach in cases of perforation from ulcer. It is thought that in the present case the posterior perforation might readily have been overlooked by a surgeon.

E. Oliver Ashe² reports a case of **perforated gastric ulcer** in which a **successful result** was obtained after **excision** of the ulcer.

G. Munro Smith³ reports a **successful case of perforated duodenal ulcer**. The patient was a man 33 years of age. When in perfect health he was seized with sudden, violent pain in the right side of the abdomen at 11 p. m. He was operated upon at 2 a. m. The most tender spot in the abdomen was the right iliac fossa. The abdomen was opened in the middle line below the umbilicus and was found to contain turbid fluid; the appendix was normal. An incision was then made above the umbilicus and a circular ulcer was found on the anterior surface of the first portion of the duodenum, about an inch from the pylorus. The ulcer was closed, the peritoneal cavity was cleansed with sponges, and a gauze drain was inserted into the upper and a rubber tube into the lower wound. During the day following the patient suffered considerable pain necessitating morphin. On the second day he was considerably jaundiced and vomited dark blood. On the third day the jaundice was deeper and the patient developed hiccup, the pulse went up to 160, and he became collapsed, but soon rallied. After this there were no further symptoms of note until 2 weeks after the operation, when he had a sudden attack of severe

¹ Brit. Med. Jour., Dec. 5, 1903.

² Brit. Med. Jour., Dec. 5, 1903

³ Bristol Med.-Chir. Jour., Sept., 1903.

pain with alarming collapse. This was relieved by a hypodermatic of morphin and the patient's subsequent history was uneventful. Smith stated that it is a great mistake to give cases of gastric and duodenal ulcer any form of food which excites gastric secretion, and especially the various forms of meat essences and extracts which are so frequently used. Milk is the safest food, but should be peptonized in order to avoid the formation of a tough curd, or it should be diluted with barley-water, lime-water, or soda-water.

G. A. Syme¹ (Melbourne) reports a case of **carcinoma of the duodenum** for which **resection** was successfully performed. The rarity of this condition is shown by the fact that Ewald found but 19 cases in 1148 cases of carcinoma of the intestine. Syme's patient was a man 40 years of age. When the abdomen was opened, the stomach was dilated but was otherwise normal. A hard thickening of the third portion of the duodenum with infiltration of the adjacent glands was discovered. The proximal portion of the bowel was dilated; 3½ inches were resected and an anastomosis by suture was performed. The patient recovered. Before the operation he weighed about 135 pounds, and 2 months later had gained 7 pounds. An examination of the bowel showed the constricted portion to measure about 1½ inches in length; the wall was ¾ inch thick. Microscopically the central thickened part was invaded with columnar carcinoma down to the circular muscular layer. On each side the carcinomatous infiltration extended, gradually diminishing as it was traced up and down until the muscularis mucosæ became intact.

J. E. Summers, Jr.² (Omaha), discusses the **treatment of posterior perforations of the fixed portions of the duodenum**. The occurrence of these lesions is so rare as to have received but little attention. Mikulicz, in 1903, stated that no case of posterior perforation of the fixed portions of the duodenum had been operated upon. Should a perforation of this portion of the bowel be suspected after opening the abdomen, Summers shows that access to the parts may be gained by cutting perpendicularly through the peritoneum about 3 cm. to the right of the descending portion of the duodenum and insinuating the finger behind toward the left. By this manipulation the descending portion of the duodenum in its lower flexure can be lifted out of its bed of loose cellular tissue and exposed. Summers has reported previously a case of hematoma which exerted sufficient pressure from behind upon the descending duodenum to cause a complete obstruction of the bowel. The peritoneum was incised and the clot evacuated sufficiently to relieve the obstruction. In the present paper a case of gunshot wound involving the anterior wall of the upper vertical portion of the duodenum and the posterior wall near the lower angle, is reported. The patient was shot in the back by a 38-caliber revolver. The abdomen was opened one hour after the accident. The anterior perforation of the duodenum and also a perforation of the gallbladder were closed. The patient's condition was so bad that no attempt was made to expose the posterior duodenal wall from in front, but a posterior incision was made and a gauze drain in-

¹ Lancet, Jan. 16, 1904.

² Ann. of Surg., May, 1904.

introduced down to the bowel. When this incision was made, it was found that the bullet had made a groove through the lower pole of the right kidney. The patient died 3 days later, the cause of death being retroperitoneal phlegmonous inflammation without peritonitis. Summers states that in another such case he will not only close the posterior opening, but occlude the pylorus by means of a purse-string suture and perform gastroenterostomy.

After a discussion of the **surgical treatment of malignant and nonmalignant diseases of the stomach**, Vander Veer¹ (Albany) reaches the following conclusions: "(1) That gastroenterostomy can be applied to all kinds and conditions of stenosis of the pyloric end of the stomach. (2) That it is a preferable operation to that of resection of the stomach, in many cases, the immediate mortality being less and the possibility of the extension of life being quite as great, with as much comfort. (3) Next to gastroenterostomy I believe gastrectomy to be the most reasonable and satisfactory operation, yet this operation will necessarily be limited to but few cases. In doing it great attention should be paid to removal of the lymphatic glands, as in this rests much of the permanent success of the operation and nonreturn of the malignant growth."

B. G. A. Moynihan² discusses briefly the **total extirpation of the stomach** and presents an account of an unsuccessful case. A short abstract of all the cases of complete extirpation of the stomach is presented. There are 16 of these, with 6 deaths and 10 recoveries. The ages of the patients ranged from 35 to 66 years. Wherever any portion of the stomach is left, however small, it is not proper to report the case as a complete extirpation. Moynihan's case was that of a woman 49 years of age. The whole stomach was involved by the growth and the glands along both curvatures were enlarged. The stomach was free, however, and there were no secondary nodules in the liver. The divided end of the duodenum was closed and the jejunum brought up through an opening in the transverse colon and anastomosed to the esophagus. The patient died 6 hours after the operation from shock. An argument against total extirpation is that when so much of the stomach is involved as to render this operation necessary, the disease has advanced so far that it is useless. With this, however, Moynihan does not agree. The whole stomach may be infiltrated without secondary deposits having occurred. In a certain small proportion of cases the total extirpation of the stomach is indicated. In the case reported Moynihan introduced an esophageal tube through the esophagus into the bowel while the anastomosis was being made, and found it a great aid.

Another article by William J. Mayo³ deals especially with **operations for the cure of cancers of the pyloric end of the stomach**, and in this article he recommends a less radical procedure than is recommended in his article published in July, 1903. The operation described in the first article should be used in cases of more extensive disease involving the body of the stomach. The operation described in the present paper.

¹ N. Y. Med. Jour., Jan. 2, 1904.

² Brit. Med. Jour., Dec. 5, 1903

³ Ann. of Surg., Mar., 1904.

which presents a mortality of 1.13 %, should be the operation of choice in the average case of fairly early disease of the pyloric region. Before describing the technic of the operation Mayo discusses the value of laboratory methods of diagnosis, the significance of palpable tumor, and the history of previous ulceration. Attention is first called to the fallacy of waiting until conclusive laboratory data can be obtained before making an exploration of the stomach. It is shown that in the early stages of the disease the laboratory findings cannot be depended upon, but that they become more marked as the disease progresses. Mayo states that a small, movable tumor in the pyloric region is not only not a contraindication to operation, but may be a favorable indication. It is interference with gastric mobility which early calls attention of the patient to his trouble and not the presence of the cancer itself. The early diagnosis depends in a great measure upon the symptoms which result from obstruction of the pylorus. In some instances in which the symptoms of cancer are marked without the evidence of pyloric obstruction the disease has advanced to a hopeless degree. Attention is directed to the frequency with which gastric cancer develops in a chronic ulcer. It is to be noted that the geography of cancer and ulcer is nearly identical. The advisability of operation depends upon the local extent of the disease and the lymphatic involvement. Mobility of the growth is an important index as to the extent of the disease. Limitation to the pyloric end of the stomach is also of prime importance, extension to the neighboring organs usually contraindicating operation. Extension into the duodenum is rare. Lymphatic involvement is the most important element in the attempt at cure of cancer of the stomach, because it is most difficult to estimate its extent. The mere presence of enlarged glands does not necessarily imply cancer. As pointed out by Lund, the situation of the glands may point to the seat of the disease. Cuneo has demonstrated that the fundus and two-thirds of the greater curvature are free from lymphatic involvement in cancer of the pylorus. If the condition is found inoperable, Mayo practises closure of the abdomen by means of a number of buried nonabsorbable mattress sutures introduced into the aponeurotic structure of the linea alba. These sutures are used in order that the patient may get out of bed in a few days, since to keep such patients in bed for 2 or 3 weeks only tends to the development of hypostatic pulmonary lesions, loss of appetite, swelling of the feet, and general debility. Nonabsorbable sutures, however, are not recommended in the ordinary closure of the abdomen after operations upon the stomach. The control of hemorrhage during the operation recommended is brought about by the early ligation of the gastric and superior pyloric above, and the right and left gastroepiploics below. "The gastric is doubly tied about one inch below the cardiac orifice at a point where it joins the lesser curvature, and divided between the ligatures. The superior pyloric is doubly tied and divided. The fingers are passed beneath the pylorus, raising the gastrocolic omentum from the transverse mesocolon, and in this way safe ligation behind the pylorus of the right gastroepiploic artery, or in most cases its parent vessel, the gastroduodenal, is secured. The left gastroepiploic is now

tied at an appropriate point, and the necessary amount of gastrocolic omentum doubly tied and cut. Sometimes the right margin of the omentum becomes very much congested from the venous obstruction produced in this way. In a few cases it has seemed wise to excise the devitalized omentum, especially if drainage is to be used, with its attendant possibilities of secondary infection." In ligating the gastroduodenal vessel and the gastrocolic omentum the finger should raise the structures away from the middle colic artery which lies immediately beneath in the transverse colon, as this vessel usually carries the entire blood-supply of the transverse colon, and interference with it has frequently resulted in gangrene of the bowel. Mayo divides the duodenum and stomach between the forceps, with the actual cautery, in order to prevent inoculation of the cut surfaces with cancer. The duodenal and stomach wounds should be completely closed and an independent gastrojejunostomy should be performed. If the patient's condition is good, Mayo prefers the posterior suture operation; if, on the contrary, the patient's condition is poor, the anterior operation with the Murphy button is preferred. Great stress is laid upon the importance of avoiding infection of wound-surfaces with cancer-cells. Mayo states that dissemination of carcinoma by rough handling or allowing infected cells to escape into the wound is not uncommon. Drainage is seldom necessary, but if the surgeon is in doubt regarding soiling, a cigaret drain should be employed. After operation the patient should have the head and shoulders well elevated. One of the chief dangers after operation is shock, and this usually results from a lack of fluids in the body. When the patient's condition is poor, the use of subcutaneous infusions of saline solution for 2 days previous to and after the operation should be employed. Hot water is given by the mouth after 12 hours, in tablespoonful doses. Rectal alimentation is begun at once.

A summary of the steps of this operation is as follows: "Step 1: Open the abdomen. Step 2: Double ligate and divide the gastric artery; ligate and divide the necessary amount of gastrohepatic omentum close to the liver, leaving most of its structure attached to the stomach. Double ligate and divide the superior pyloric artery and free the upper inch or more of the duodenum. Step 3: With the fingers as a guide underneath the pylorus, in the lesser cavity of the peritoneum, ligate the right gastroepiploic or gastroduodenal artery, and progressively tie and cut away the gastrocolic omentum distal to the glands and vessels up to the appropriate point on the greater curvature, and here ligate the left gastroepiploic vessels. Step 4: Double clamp the duodenum, divide between with the cautery, leaving $\frac{1}{4}$ inch projection. With a running suture of catgut through the seared stump the end of the duodenum is closed as the clamp is removed. A purse-string suture about the duodenum enables the stump to be inverted. The proximal end of the stomach is double clamped along the Mikulicz-Hartmann line and divided with the cautery, leaving $\frac{1}{4}$ inch projection. Suture through the seared stump with a catgut buttonhole suture. This is again turned in after removal of the clamp by a continuous silk or Cushing suture. Step 5: Independent gastrojejunostomy. Step 6: Closure of the wound."

W. Petersen¹ (Heidelberg) reports the **results of anatomic and clinical researches in gastric and intestinal carcinoma**. The work was done by a number of investigators, and the number of specimens examined was 200. Gastrointestinal cancers as opposed to skin cancers most commonly grow in a unicentric fashion. Progressive cancerous degeneration was not observed with certainty in the lymph-glands lying next the tumor. "The unicentric growth is shown by: (1) The continuity of each cancerous nodule one with the other (evidenced in serial sections). (2) The method of invasion of glands by the cancer. There is always a sharp line of demarcation between the cancerous and the healthy cells. In no place was there any cancerous changes in the latter. (3) The frequent occurrence of pure interglandular growth in which there was no progressive degeneration of the surroundings. (4) Metastatic recurrence, stomach, mamma."

In conclusion, Petersen gives a few statistics from the Heidelberg clinic. (1) Rectal carcinoma: In 248 cases, mortality, 13 %. Permanent cure, 18 % to 20 %. Thirteen patients lived over 10 years. (2) Gastric carcinoma: (a) Gastroenterostomy, 214 cases. Early mortality, 35 %. The last 100 cases, 18 %. Life prolonged 4 to 5 months. Marked decrease in suffering. (b) Resection. Fifty-seven cases. Mortality in first 24 cases, 35 %; in last 33 cases, 17 %. Of the 30 patients operated on more than 3 years ago, 18 survived, and of these 7 still live. The 4 longest survivals are 12, 11, 5, and 4 years. Resection is now more practised than it was because: (1) Resection is not more hazardous than gastroenterostomy. Twice as many patients die from pneumonia after the latter than after the former operation. The removal of the decomposing cancerous tissue appears to be of great value. (2) The prospect of radical cure is much greater than was thought. The stomach and duodenum must be excised as widely as possible. (3) Even when recurrence takes place, resection prolongs life on an average about 9 months, as opposed to the 4 to 5 months of its rival."

DISEASES OF THE PERITONEUM AND INTESTINES.

George H. Monks² has carried out an extensive study on the cadaver for the purpose of discovering to what extent the various parts of the small intestine may be identified through an abdominal wound. The subject of his paper is **intestinal localization**. In studying the characteristics of the different portions of the small intestine Monks was able to localize a loop of small intestine drawn through an abdominal incision in 75 %, with errors of less than 3 feet. In 25 % of the cases the localization was done with errors of less than 1 foot. Attention is called to the fact that there is no dividing-line between the jejunum and the ileum, and that the division is merely arbitrary, the jejunum meaning

¹ Proc. German Surg. Cong., 1903; Ann. of Surg., Dec., 1903.

² Ann. of Surg., Oct., 1903.

only the upper part of the bowel and the ileum the lower part. The attempt to determine the direction of the gut was made in 90 different loops in 15 different cadavers. In 8 the direction proved to be wrong; in 82, or 91 %, it was right. The small intestine was found to vary in length from 15 to 30 feet. The characteristics of the different parts vary with the individual, and there is no infallible sign to indicate any particular point of the bowel except at the two ends, which are fixed. For the purpose of determining grossly the position occupied by the various portions of the small intestine Monks has divided the abdomen into 3 portions, using as a guide the mesenteric attachment to the spine. He has found that, in normal conditions, the upper 6 feet or so of the tube is generally confined to the left hypochondriac region, occupying a deep fossa there under the ribs, and in such a position that its coils would not usually be encountered through any of the ordinary abdominal incisions. The middle part of the intestine usually occupies the middle parts of the abdomen, while the lower part of the tube is generally in the pelvis and in the right iliac fossa. The fact should not be overlooked, however, that there are occasional and marked exceptions to this rule. Among the more valuable localizing signs the following are mentioned: *The thickness of the intestine*: The upper part of the small intestine is normally thicker than any other portion, due to the presence of large and numerous valvulae conniventes and to the great development of the muscular layers. *Color and general vascularity*: The upper portion of the bowel in normal conditions is bright pink or red, the color gradually fading as we go down and the vascularity also growing less marked. *Valvulae conniventes*: In the upper part of the bowel the valvulae conniventes are large and numerous and can always be felt and generally seen as pinkish or whitish rings more or less complete. They gradually diminish in number, but especially in size, as we pass down the tube, until a point about 14 or 15 feet from the end of the duodenum is reached, beyond which they can seldom be seen or felt. *General vascularity of the mesentery near the bowel*: Opposite the upper part of the bowel the mesenteric vessels are distinctly larger than opposite any other part of it, gradually diminishing as we pass downward until the lower third is reached, where they remain about the same. *Loops of the mesenteric vessels*: Opposite the upper part of the bowel there are only primary loops, with an occasional secondary loop. As a rule, secondary loops become a prominent feature at about the fourth foot. As we continue further downward the secondary loops—and, possibly, tertiary loops—become still more numerous and the primary loops smaller, the loops all the time getting nearer and nearer to the gut. Opposite the lower part of the gut the loops generally lose their characteristic appearance, and are represented by a complicated network. *The vasa recta*: Opposite the upper part of the intestine the vasa recta are from 3 cm. to 5 cm. long, when the loop of small intestine to which they run is lifted up so as to put them gently on the stretch. In the lower third they are very short, being generally less than 1 cm. in length. *Thickness and translucency of the mesentery*: These conditions vary markedly in different subjects, the amount of fat influencing

them greatly. The mesentery is thinnest at the upper part of the intestine, and becomes thicker as we go down. Where the mesentery is thick and the vessels are not readily seen, Monks finds that in the uppermost part of the intestine when the mesentery is held to the light that near the bowel little transparent spots may be observed between the *vasa recta*. These he calls "lunettes," and finds that they gradually grow smaller, become streaked with fat, and disappear at about the eighth foot. *Tabs of fat close to the mesenteric border of the intestine:* These are usually present in the lower third of the intestine and project from the mesentery toward the bowel. *Direction of the stretched mesentery* may also give some clue as to the portion of the bowel. *Determination of direction:* Peristalsis may indicate the direction, though occasionally it may be reversed. The right and left sides of the mesentery may be determined by passing the fingers down to its attachment and then, correcting any twist that may be present, the direction of the bowel may be observed. In this connection Monks makes the valuable suggestion that in general irrigation of the abdomen it is important to see that the irrigating tube goes first to one side and then to the other of the mesentery, otherwise the irrigation may not be complete. In conclusion he states that he does not feel that a determination of the portion of bowel presenting in an abdominal wound can be made absolutely, but that by consideration of the points mentioned an approximate idea may be gained. [This is one of the most valuable of recent studies. We habitually employ the conclusions of Monks and find them valuable aids in operations.]

The behavior of the costal arch in diseases of the abdominal organs and its importance as a diagnostic symptom is the subject of a paper by Ellsworth Eliot, Jr.¹ (New York), who illustrates his paper by a report of 23 cases. The following are his conclusions: "(1) That the symptom of costal resistance may always be elicited in the acute and subacute inflammatory process of the contiguous underlying organs. In chronic inflammation of these same organs it is present irregularly, either generally, when the organ is increased in size, or during a transitory exacerbation of the chronic inflammatory process. In neoplasms or cysts, increased costal resistance may be obtained only when the tumor has reached a sufficient size mechanically to interfere with the movement of the arch. (2) That the degree of resistance is in direct ratio to the intensity of the inflammatory process. (3) That the increase of costal resistance is most marked in that segment of the costal arch which is closely situated to the original point of infection, or, in the case of neoplasm, to that part of the arch which lies over the most prominent part of the tumor. (4) That its value as a diagnostic symptom is greatest in pathologic conditions invading the upper half of the abdominal cavity, especially of the liver, the stomach, the pancreas, the gallbladder, the spleen, the duodenum, the kidneys, and in extensive aneurysm of the abdominal aorta. Eliot has had but little opportunity to observe this symptom in supradiaphragmatic process. In cases of empyema, the abscess-cavity is generally encapsulated and does not usually occupy the

¹ Med. News, Apr. 23 and 30, 1904.

lowest part of the thoracic cavity. Only when so situated is there resistance of the costal arch proper. In higher positions any difference in the rigidity of the overlying rib or ribs is very difficult to detect and unsatisfactory. (5) That the presence of asymmetry in the elastic recoil is very much less frequently observed than asymmetric increase in the costal resistance, the former being present only in cases of cysts, neoplasms, and inflammatory exudates in which the acute symptoms have subsided, while it is invariably absent in all the acute and subacute inflammatory. (6) That with the subsidence of the inflammatory process, whether by radical or palliative procedure, the costal resistance again returns to its normal condition. (7) That the presence of this symptom is very valuable not only in facilitating accurate diagnosis, but also in serving as a useful guide to that incision through which the inflammatory focus may be most rapidly exposed and satisfactorily treated. (8) Finally, that proper and skilful technic in determining the presence or absence of this symptom may be easily acquired, and that, therefore, the application of the symptom may be utilized by the general practitioner and not confined to those engaged in the pursuit of any particular specialty."

Spontaneous gangrene of the hollow viscera is considered at some length by Roswell Park,¹ who reports 2 cases. The first case is that of a mail-carrier 45 years of age who was perfectly well and working until he was suddenly seized with severe abdominal pain. He was brought into the hospital almost collapsed, with a rigid, very much distended abdomen, vomiting frequently a material which was almost fecal and which had a coffee-ground appearance. The patient's pain had been agonizing. Physical examination revealed nothing except meteorism. The abdomen was opened about 3 hours after Park saw the patient. When the cavity was opened there escaped a quantity of most offensive, blood-stained fluid, after which the patient again collapsed and almost died upon the table. Exploration showed that the entire small intestine from stomach to cecum was gangrenous and in places almost ready to slough. The large intestine seemed involved in the same process, but to a less extent. The parietal peritoneum seemed almost as much involved as the visceral layer. The interior of the abdomen presented a perfectly cadaveric appearance, while the odor was horribly offensive. The abdomen was closed and the patient died 2 or 3 hours later. The second case is that of a woman, 33 years of age, who was seen by Park 30 hours after the onset of symptoms. The abdomen at this time was very much distended, the muscles were rigid, and the patient was vomiting greenish mucus which had a distinctly fecal odor. Her pain, which at first was agonizing, had subsided, and excepting for the vomiting, she was comfortable. Immediate operation was performed, and when the abdomen was opened, foul-smelling fluid escaped. When the small intestine was exposed, every layer of it was found to be gangrenous. The posterior surface of the omentum was almost black from gangrene. The entire intestinal tract (both large and small intestine) seemed to be in the

¹ Ann. of Surg., Apr., 1904.

same condition. A remarkable feature of this case is that the patient lived for 48 hours after the operation and was comfortable and talked quite freely with those about her. At this time, however, she was again seized with intense pain, which was relieved only by inhalations of chloroform. She died 9 hours after the onset of this symptom. In neither case was an autopsy allowed. Park states that these cases are more pronounced than any he has seen reported in the literature on the subject. In considering the cause of the condition it must be remembered that while the veins of the mesentery have no valves, the arteries, like those in the brain, are terminal, and collateral circulation is, therefore, not prompt or complete. According to Gallovardin, the most frequent cause of mesenteric embolism is mitral stenosis; the next most frequent cause is probably arterial sclerosis. It is possible that embolism and thrombosis may occur simultaneously. Presumably the trouble occurs in the arteries more often than in the veins. Kader explains the meteorism, which was the most pronounced feature in these cases, as due to the complete paralysis which follows such acute gastromalacia and enteromalacia. Although mesenteric thrombosis follows such lesions as intestinal ulceration, especially of the tuberculous variety, intestinal cancer, splenic infarct, etc., its rarity in typhoid fever is remarked. In discussing the symptoms of the condition it is said that the more complete the occlusion of the mesenteric vessels, the more sudden and overwhelming will be the symptoms. Enumerated in the order of their importance, the symptoms are as follows: Intense, sudden, agonizing pain, sometimes paroxysmal; early diarrhea, which is usually bloody after a few hours; obstructive symptoms; vomiting, which occurs early and which may be bloody and later fecal; rapid pulse; subnormal temperature; meteorism, which begins early and becomes very marked; marked abdominal rigidity; later, the presence of fluid in the peritoneal cavity. When mesenteric thrombosis or embolism is suspected, a careful search should be made for similar lesions elsewhere in the body, and if they are found, they add to the certainty of the diagnosis. It is practically impossible to distinguish between occlusion of the artery and vein. Park devotes considerable space to the discussion of the differential diagnosis of this condition, and concludes with the statement that practically all these conditions excepting intrathoracic lesions call for immediate operation, and that, therefore, too much time should not be spent in an endeavor to make an exact diagnosis, but that the indications should be heeded and the abdomen opened promptly. Park has been able to find but one case of mesenteric occlusion which did not prove fatal, and that is reported by Chiene, who saw the case in the dissecting-room. In conclusion Park states: "In the presence of sudden and acute symptoms, which include intense abdominal pain, collapse, and rigidity of abdominal walls, very little time should be wasted in speculation as to the character of the lesion. This triad of symptoms constitutes a reliable and exacting demand for abdominal section, followed by such suitable measures as the case may call for or permit. No such case as would be lost without an operation would be lost in consequence of it, while every such case must, without it,

of necessity prove fatal. Of these cases, as of most others in the hands of competent men, it should be said that they *die in spite of operation, not because of it.*" [In a subsequent article by Jackson, Porter, and Quinby it is stated that 47 patients have been operated upon and 4 recovered.]

Jackson, Porter, and Quinby¹ (Boston) present a study of 214 cases of **mesenteric embolism and thrombosis**. Of these cases, 30 are reported minutely, a large portion of the paper being taken up with an interesting account of them. In regard to the symptoms and physical signs of this condition, pain is the first mentioned. In 157 cases accurate data as to pain were given. In 5 patients no symptoms referable to the abdomen were present. In one-third of the cases the pain was described as general abdominal; epigastric pain was present in 8; pain about the umbilicus in 7; in the lower abdomen in 4; in the right hypochondrium in 4; in the upper abdomen in 4; in the hypogastrium in 3; in the right iliac fossa in 3. Single cases of pain in other parts of the abdomen are also referred to. Nausea and vomiting usually followed pain. Although bloody stools have been considered essential to the diagnosis by Kussmaul and Gerhardt, the authors' cases contradict this view. In but 41 % of these cases did blood occur in the stools. It is certain, however, that when it does occur, it is of great diagnostic value. In 115 cases the absence or presence of abdominal tenderness was recorded; in 30 % it was absent and in 70 % it was present. Distention was a rather late symptom. It was present in 78 % of the 125 cases in which it was mentioned. Intestinal obstruction is one of the most important symptoms, and occurred in many of the cases. The temperature usually falls below normal, though not infrequently an increase is observed. Talke makes the occurrence of purpura of considerable diagnostic value. Gerhardt makes the following diagnostic postulates:

1. There must be present a source of the embolus.
2. There are present copious intestinal hemorrhages, unexplainable by disease of the gut-wall or by hindrance to the portal circulation.
3. There is quick and marked fall of body temperature.
4. Colicky abdominal pains, which may be very severe.
5. Later distention of the abdomen and free fluid.
6. Emboli of other parts may have been present before, or may occur simultaneously with, closure of the mesenteric vessels.
7. There arises sometimes a large, palpable blood-tumor between the layers of the mesentery.

Clinically it is very seldom we find all these points present, and so the diagnostic value of the above schema is considerably impaired. It cannot be wholly discarded, however, but, as Neutra says, only in the presence of the greatest number of points of this schema can the diagnosis be made with any degree of certainty.

The cases most frequently confounded with this condition are those in which the obstruction is due to a mechanic hindrance to circulation, such as intussusception, volvulus, strangulation by bands, or obstruction from

¹ Jour. Am. Med. Assoc., June 4, July 2 and 16, 1904.

gallstones or cancer. The authors agree with Hemmeter that in the large majority of cases the nearest approach to a recognition of the correct state of affairs will be a diagnosis of intestinal obstruction. The prognosis is very bad, the mortality being 94 %, even granting the diagnosis to be correct in all the cases. Neutra is quoted as saying: "In cases of acute onset, the prognosis is indeed very grave, but by no means absolutely bad, since behind these severe symptoms there may be hidden a chronic process which favors the formation of a collateral circulation, and on this the prognosis depends. If, on the other hand, the course is chronic, and only a few exacerbations are present, between which there is complete absence of symptoms, the prognosis, nevertheless, is moderately bad, since in these cases it must be assumed that because of some hindrance a competent collateral circulation cannot be formed. Accordingly, thrombosis of mesenteric arteries is of relatively better prognosis than embolus."

The treatment should consist in exploratory laparotomy in every case in which the patient's general condition warrants it and as soon as even a tentative diagnosis has been made. Operation has been performed for the condition in 47 of the reported cases, with a mortality of 92 %, only 4 cases having recovered so far as reported.

In order to see what the chances of recovery with operation might have been in the cases not operated upon, a review was made of the pathologic findings in these cases. It is shown that some of these would not have been benefited by excision of the gangrenous area. In 15 cases, however, there is nothing in either the history or the autopsy report to show that resection would have been contraindicated. In these the area of bowel involved was not extensive, and a resection might have resulted in recovery. It is thought wise not to do a complete operation at once, but to resect the gangrenous bowel and fix the distal and proximal ends in the wound and later do an anastomosis. With both of the ends thus opened the distention is at once relieved and the intestine can be watched for signs of further gangrenous involvement. One of the great advantages of this method of treatment is the short time required for the operation work.

In a communication the late J. McFadden Gaston¹ (Atlanta) refers to the **technic of McGraw's method of intestinal anastomosis**, and quotes from an article which he published in October, 1884, in Gaillard's Medical Journal, recounting experiments carried out upon 5 dogs with the idea of determining the advisability of anastomosing the hollow viscera of the abdomen by means of an elastic ligature. These experiments demonstrated the fact that by means of an elastic ligature a fistulous connection between the gallbladder and duodenum could readily be effected.

F. T. Murphy² (Boston) has conducted numerous experiments with the **McGraw elastic ligature** and reaches the following conclusions: "These experiments show that a successful anastomosis between the stomach and intestines, or two loops of intestine, is possible by means of the elastic ligature. The method is not applicable when an immediate opening is required. The time of the cut-out varies, depending upon

¹ Amer. Med., Dec. 12, 1903.

² Boston M. and S. Jour., Jan. 28, 1904.

the character of the ligature, the method of application, and the resistance of the tissues in any case, but the ligature will ultimately cut out. A knot at either end of the elastic loop increases the rapidity of the cut-out. The pinching of the gut by the ligature seems to cause no bad symptoms. The serous surface of the outside of the joint when completed is smooth. The anastomosis by gross or microscopic examination shows no evidence why there should be any greater tendency to contraction of the opening than with the ordinary methods of intestinal suture. The procedure causes a minimum operative risk, as regards both shock and infection. Adhesions across the opening are a possible, but not a probable, complication. Extending these conclusions to practical operative work, it is my opinion that in cases in which an immediate opening of the bowel is not imperative, and in which the avoidance of operative shock is an important factor, the elastic ligature may prove to be the operation of choice in gastroenterostomy and lateral anastomosis."

The following conclusions are offered by J. W. Draper Maury¹ (New York), after reporting some experimental investigations regarding a **modification of the McGraw elastic ligature**:

- "1. The McGraw elastic ligature can be so inserted as to 'punch out' as large an area of the juxtaposing walls as may be desired, with at least as much certainty and with greater safety than the Murphy button.
2. The margins of such openings are smooth and not unduly cicatrized.
3. The elastic ligature may remain *in situ* after punching the openings, although this is less likely to happen if tied with iodized catgut.
4. Such retention in the mucosa of so soft a material is not apt to be harmful or permanent.
5. The time required is not sufficiently increased to render the use of this technic impractical.
6. Perhaps enough has been suggested to stimulate further research by others, so that the actual facts in these most interesting problems may shortly be brought to light."

McGraw,² in a communication, refers to cases reported in Maury's article on the **elastic ligature** in which bands of mucous membrane were found across the anastomotic openings. In his first operation upon the human subject McGraw met this same difficulty and the patient died. He says: "The anastomosis was found to be perfect, except that a narrow bridge of mucous membrane crossed the orifice on the gastric side. The explanation is simple: The folds of mucous membrane rise in ridges, and if the needle is passed in too horizontally, these ridges will be perforated and strips of the mucous membrane will be left outside of the ligature. This accident may be avoided by care in passing the needle. It should be entered at a right angle to the long axis of the gut and made to traverse its cavity without transfixing the mucous membrane. In actual practice, as tested now in many cases by many surgeons, the simple method which I described in my first article is entirely successful in accomplishing its purpose and is to be preferred to any more complex procedures. The proposal of Dr. Maury to substitute a ligature of heavy iodized gut for the rubber would be, in my opinion, disastrous, as the

¹ Med. News, Sept. 12, 1903.

² Med. News, Oct. 24, 1903.

constant unremitting elastic contraction of the rubber cord on the tissues is the essential element in securing their certain absorption."

Zagari¹ reports from the University of Perugia a **unique case of abdominal tumor**. The patient was a farmer 32 years of age who was married and had 2 children. His family history was negative; he had 2 brothers and 4 sisters perfectly normal. When 20 years of age the patient was examined for admission into the army, but was rejected because of a tumor which was found in the right upper abdomen. There was no pain or tenderness about it, and until it was found at this examination the patient had no knowledge of its existence. From this time it continued to grow, however, until it reached the size of a child's head, producing discomfort on account of its weight. The man never had vomiting or other symptoms. For the last year, however, respiration had been somewhat interfered with. In April, 1900, he was admitted to the hospital and a most careful examination was made of the abdomen. It was finally decided that the tumor was probably a hydatid cyst attached to the left lobe of the liver; it was aspirated, and 4 pints of turbid fluid about the color of *café au lait* were evacuated. There were some fat-granules and globules in the fluid, but there was no albumin and no echinococci. There was a quantity of detritus, however. There was no evidence that the fluid was from a pancreatic cyst. With evacuation of the fluid the tumor disappeared and the patient returned to his work 4 days later and was well for nearly 12 months, when the tumor had again reached its previous size and the patient was taken ill with an intermittent fever, characterized by chills and sweats. His physician supposed that suppuration had taken place and again tapped the tumor, but removed the same kind of fluid as that obtained previously. He was again admitted to the hospital and the abdomen was opened. When the cyst-wall was incised there escaped a quantity of dark-colored fluid and an incompletely developed fetus, measuring 29 cm. in length. Bleeding was profuse and the operation was not completed. The patient died the next day. At a postmortem examination it was discovered that the cyst lay between the layers of the mesentery and had become adherent to the stomach, liver, and transverse colon. A cut accompanies the report, showing the character of the fetus. There were no head and no upper extremities, but there was a distinct vertebral column, including the cervical portion, and the bones of the lower extremity were very well developed, there being a femur, tibia, and fibula on each side. The feet were largely cartilaginous. The muscular portions of the legs were also well developed. Two completely developed incisor teeth were encountered and two clavicles. Zagari goes extensively into the embryologic side of this question, and also gives brief abstracts of 7 other cases which are somewhat similar to this. Repin and Duval laid down a rule to distinguish these tumors from teratomas of the ovary and embryoidal cysts. These authors state that the tumors give evidence of their existence shortly after birth, and that the period of their growth is confined to the first few years of the carrier's life, while dermoid cysts of a parthenogenetic

¹ *Riforma Medica*, 1903, No. 19.

nature make their appearance between 20 and 35 years. The present case, however, shows the fallacy of this rule, as do the other cases which Zagari has collected from the literature. In but 2 of 7 cases reported was the condition discovered at operation, and both patients died. In the others the condition was discovered postmortem.

J. A. Blake¹ considers the **treatment of the peritoneum in diffuse peritonitis**, basing his remarks upon a table of 32 cases which have been operated upon within the past 2½ years. From a standpoint of therapy the classification of purulent peritonitis according to the bacterial origin is not of so much importance as that based upon the progress and extent of the peritoneal involvement, and Blake divides purulent peritonitis into the following 3 classes:

"1. Cases with abscess, in which there is a localized collection of pus with limiting adhesions. 2. Cases with spreading peritonitis, in which there is no limitation of the process by adhesions or gravitation, but in which the limits are ascertainable. 3. Cases of general peritonitis, in which no parts of the peritoneum, possibly excepting the lesser sac, can be demonstrated as free from the invasion. The last two groups are comprised under the general term, diffuse peritonitis."

The 32 cases appended to his article comprise 17 cases of spreading and 15 cases of general peritonitis. Of the cases of spreading peritonitis, 10 were caused by appendicitis, all of which recovered; 1 by perforating typhoid ulcer, the sufferer from which died; 4 by perforating ulcer of the stomach and duodenum, 2 of which died; 2 from gonorrheal infection, both recovering from the peritonitis, but 1 dying later, on the thirty-fifth day, from obscure pyemia. Of the cases of general peritonitis, 7 were due to appendicitis, of which 4 died; 1 to perforating typhoid ulcer, the victim of which recovered; 1 to perforating tuberculous ulcer, which died; 6 to infection through the fallopian tube, 1 of which was probably pneumococcic infection, 1 a mixed streptococcic and gonococcic infection, and the remainder gonorrheal, of which 1 recovered and 5 died, a mortality of 83 %. Blake says that he cannot see the difference between a case of extensive spreading peritonitis caused by infection from the appendix and one arising from any other cause, and cannot believe that such an extensive peritonitis would be localized or arrested by any form of treatment other than operation. It is, therefore, his custom to operate upon these cases as soon as they can be prepared. He does not think that in such cases the peritoneum is to be so much feared as the systemic infection through the lymphatics and vessels of the meso-appendix. Regarding the condition of the peritoneum he states that he believes an inflamed peritoneum is far better able to withstand an augmentation of the infection than is a healthy peritoneum the scattered contents of a quiescent abscess. As to cleansing the peritoneal cavity, it is Blake's custom to use salt-solution very freely and usually to leave a quantity of it in the abdomen. His reasons for preferring irrigation to sponging are that it can be carried out through a relatively small incision; that the peritoneal endothelium is less injured, and that the

¹ Ann. of Surg., Aug., 1903.

toxins are more readily diluted and removed. All loose fragments of fibrin are sluiced out, but the adherent portions are left.

"In considering the questions of drainage the cases are best divided into 2 groups, one including those in which the focal cause or origin can be removed or eliminated, the other the remaining cases. To the first group would be assigned most cases of peritonitis arising from perforation of the hollow viscera, from appendicitis, salpingitis, and possibly cholecystitis; to the second, those resulting from rupture of abscesses, from pancreatitis, and cholecystitis in which cholecystectomy was contraindicated. In the first group drainage may or may not be employed; in the second it is, as a rule, necessary."

Blake formerly advocated the freest drainage in cases of diffuse peritonitis, but lately he has confined drainage to the field of operation, and in many recent cases has omitted drainage almost entirely, employing it only when the presence of necrotic tissues or hemorrhage has demanded it. One of the great disadvantages of drainage is its tendency to produce obstruction of the bowels, either by direct pressure or the production of adhesions. Blake, however, thinks that there has been much less postoperative meteorism and vomiting in the cases not drained than in those which were drained. Not infrequently after operation in cases of diffuse peritonitis localized collections of pus form in various parts of the peritoneum during convalescence. He does not think that the tendency to the formation of these foci is in any way lessened by drainage. In the cases reported this complication was observed 4 times—twice in drained and twice in undrained cases. In 2 appendix cases which developed late abscesses he thinks that drainage might have prevented their occurrence. The study of his table shows that suppuration of the parietal wound is apt to occur in the undrained cases. It is, therefore, his rule at present to establish superficial drainage. The duration of convalescence is much shortened by the avoidance of drainage, the difference being from 13 to 18 days. The return to a normal temperature is also earlier in the undrained than in the drained cases.

In writing on the **treatment of diffuse peritonitis** Lund¹ (Boston) states that he believes that the most important point in the treatment of this condition is the immediate removal of the infecting focus. He thoroughly agrees with the attitude Blake has taken with regard to this question. Although in the Boston City Hospital he has seen cases of diffuse peritonitis quiet down under the Ochsner method of treatment, he has seen many more cases progress until operation had to be performed under conditions much more serious than obtained when the patients first presented themselves. Lund is an advocate of early operation and states that when this cannot be done because the patient has not been referred to the surgeon promptly, operation is still more imperative because the inflammatory condition is rapidly spreading. Wherever feasible the appendix or whatever is the original focus of the disease should be entirely removed. This is necessary as well for the future as for the immediate welfare of the patient. Prolonged and thorough irriga-

¹ Boston M. and S. Jour., Nov. 26, 1903.

tion with salt-solution through a large glass nozzle is strongly advocated, as it not only removes the inflammatory exudates, but is absorbed to some extent, and thereby increases the fluid in the vascular system and starts the flow in the right direction after the introduction of gauze drains. Evisceration for the purpose of removing the adherent lymph, etc., is believed to be unnecessary and usually harmful. The best method of drainage is by a number of gauze packs with rubber tubes in their center. Surrounding gauze drains with rubber tissue, although it facilitates their removal, Lund believes results in the production of less firm adhesions about the drainage tract, and therefore he does not employ this method. Elevation of the head of the bed and the upper portion of the body by means of pillows to facilitate pelvic drainage is a procedure which is commended. If the peritonitis is accompanied by distention of the intestine, enterostomy with emptying of the bowel, followed by the injection of a solution of epsom salts, is believed to be of great value, as several cases of general peritonitis have apparently been saved by this procedure. Permanent drainage of the intestine has been employed with advantage in far-advanced cases. This is obtained by fixing a glass tube into the intestine, the gut being attached to the deep fascia. This procedure, however, is usually resorted to in case the distention recurs after the emptying of the bowel at the primary operation.

Another paper by Lund¹ deals with the **value of enterostomy in selected cases of peritonitis**, and in it numerous cases are reported. His summary is as follows: "Enterostomy is indicated for obstruction or paralytic distention of the intestine from whatever cause, after the ordinary means for relief of such distention have failed. It is especially applicable for distention after operations for acute appendicitis or general peritonitis. Under such circumstances it may restore to life cases in which death seems inevitable. Secondary ileostomy is the operation of choice. Local anesthesia is to be preferred. The subsequent operation for closure of the fecal fistula is usually safe and successful."

R. S. Fowler² (Brooklyn) reports the results in **diffuse septic peritonitis treated by the elevated head and trunk position**. He states that—"From October 17, 1899, to January 17, 1904, Dr. George R. Fowler and myself have operated upon 100 well-marked cases of diffuse septic peritonitis resulting from inflammation of the vermiform appendix. We have not refused operation to any case, however desperate. Of these cases, 67 % have resulted in recovery." Before the employment of the elevation of the head and trunk in the after-treatment but 25 % of the cases of diffuse peritonitis were cured. He states that—"At the German Hospital we have operated upon 46 consecutive cases with but 9 deaths—81.25 % of recoveries; at the M. E. (Sney) Hospital, 30 cases with 12 deaths—60 % of recoveries; at the Brooklyn Hospital, 22 cases with 12 deaths—45.5 % of recoveries." Practically the only difference in the treatment of the former cases and these latter ones is in the matter of drainage. The following are what Fowler believes to be the salient points in the treatment of these cases: "(1) A small incision and the

¹ Jour. Am. Med. Assoc., July 11, 1903.

² Med. News, May 28, 1904.

avoidance of eventration; (2) thorough cleansing of the primary focus of infection and removal of the appendix. (3) Evacuation and cleansing of all accessory abscess cavities and the pelvis before washing out the cavity with soda-peroxid solution, followed by hot saline. (4) The continuance of the saline flushing until the sutures are placed, and for the most part tied. (5) The provision of proper drainage for the pelvis, either by means of a large glass tube containing a capillary drainage strip emerging through the lower angle of the wound, or, in females, by a large caliber rubber tube filled with wicking passed through a posterior colpotomy incision. (6) The drainage of accessory abscess cavities with gauze or wicking. (7) The elevation of the head of the bed to accelerate the drainage of septic fluid into the pelvis, where it can be removed through the glass tube or, in case of vaginal drainage, find a ready exit."

The **operative treatment of diffuse purulent peritonitis** is dealt with by Mirsnoff,¹ who believes that operation is useless in general puerperal or postoperative peritonitis due to streptococci or to staphylococci. Operation may retard the fatal issue in such cases, but is powerless to avert it. On the other hand, when the peritonitis runs a protracted course, being caused by the colon bacillus or the gonococcus, or even by enfeebled cultures of pus-cocci, then a timely evacuation of the peritoneal cavity and the removal of the infectious source are decidedly beneficial. In these instances it is advisable to pack the Douglasian cavities and other folds with gauze, instead of using free flushing and glass or rubber drainage-tubes.

A. S. Lobingier² discusses **tuberculous infections of the peritoneum and adnexa**, quoting very freely from the literature on the subject. Lobingier believes that the conclusions of Veit, in a recent address delivered before the International Congress of Gynecology, present the sanest view of this subject thus far published. "Veit believes, with Borchgrevink, that peritoneal tuberculosis may become cured spontaneously, but does not admit that as many will recover without operation as with it. He considers laparotomy, in all but the ulcerative caseous variety, almost invariably rewarded by cure or substantial benefit, the few failures being due to an advanced and general infection of other organs. Recent cases should be operated on promptly; chronic subjects should be closely observed, and operated on if spontaneous subsidence seems improbable. Veit favors simple section in the linea alba, mopping out the effused fluid, and closure of the wound. When the adnexa are involved, they should be removed. Cure he believes to be due to the antitoxic action of the serum from the wound. Statistics show 50 % cured and 25 % greatly benefited after the lapse of from 4 to 5 years from the date of laparotomy. Tuberculous lesions in localities outside the abdomen are not materially benefited."

Von Bruns³ deals with **pneumococcus peritonitis** and reaches the following conclusions: "1. Pneumococcus peritonitis is a comparatively rare disease, more frequent in children than in adults, in girls more

¹ Jour. Akousherstwa, Nov., 1903; Amer. Med., Apr. 2, 1904.

² N. Y. Med. Jour., Dec. 5, 1903. ³ Beitr. z. klin. Chir., Bd. xxxix, Heft 1.

frequently than in boys. 2. It occurs secondary to diseases of the lungs or middle ear, or may be primary. 3. The exudate is very rich in fibrin, which very quickly tends to mat together the intestines and become sacculated. In the most advanced cases the entire mass of intestines becomes matted into a lump surrounded by pus. 4. There is a typical symptom-complex. In typical cases, especially in children, it begins as an acute peritonitis, which is followed by a chronic stage, with comparatively few symptoms referable to the peritoneum. 5. The probable diagnosis may be made, without bacteriologic examination, from the typical course of the disease and the characteristic appearance of the pus (greenish-yellow in color, odorless, rich in fibrin). Bacteriologic examination will determine it definitely. 6. Prognosis is good. Spontaneous recovery is possible, but rare. Recovery following operation is the rule. 7. Treatment consists of evacuating the pus and drainage."

Wetherill¹ (Denver) discusses **chronic adhesive sclerosing peritonitis or plastic peritoneal sclerosis**. This condition is one which is treated but slightly and irregularly in American text-books, but it is well described in a number of German works, and especially in the new edition of the Handbook of von Bergmann, von Bruns, and von Mikulicz. According to the description in the handbook mentioned, it may occur at one or many points in the peritoneal cavity, but the areas about the female genital organs, the gallbladder, the flexures of the colon, the posterior part of the peritoneum, the root of the mesentery, the mesentery of the sigmoid flexure, and the omentum are the points of selection. As a consequence of the chronic inflammation, thickening of the peritoneum results, which leads to shrinking. The condition may also occur as a sequel of acute infections of the intestines. Trauma may also be an etiologic factor. The complaint may, however, start in a chronic form and reach a high state of development without an acute stage having preceded and without the patient being able to give a definite cause for its onset. The functions of the large intestine are very much interfered with, through adhesions in the cecum and flexures and mesentery of the sigmoid. Chronic constipation is, therefore, a frequent result of such conditions. The essentially pathologic characteristic is extensive subperitoneal fibroid infiltration or sclerosis without ascites and without serofibrous or fibrinopurulent exudation. Wetherill narrates a case which he operated upon several times in conjunction with Leonard Freeman, in which the typical signs of this condition existed. The patient was first operated upon for chronic appendicitis and movable kidney. When the wound was closed, it was found impossible to approximate the peritoneal surfaces below the muscles, the peritoneum having contracted so that it could not be brought together. This state of things is considered pathognomonic of this disease, and when it is met every effort should be made to repair the breach in the peritoneum, as visceral adhesions are sure to occur and give rise to serious complications later, as occurred in this case. The patient improved after the operation, but about a year later developed nausea, vomiting, constipation, flatulency, and finally

¹ Jour. Am. Med. Assoc., Mar. 5, 1904.

great rectal pain and tenesmus. Examination revealed an undilatable stricture of the rectum 3 inches from the anus, and a hard tumor in Douglas' pouch, apparently connected with the rectum. The abdomen was again opened and the pelvic tumor proved to be a solid tumor of the right ovary, 3 inches in diameter and pedunculated. The rectal band was entirely distinct from it. The rectum, sigmoid, and whole colon were densely packed with hard feces, and the pylorus and intestine were matted together in a huge mass which was very adherent to the old scar. The detachment of these adhesions was impossible. The sigmoid was drawn through a valve-like opening and the usual colotomy made on the fourth day. Again the difficulty of the first operation was encountered in closing the wound. The contraction was much more pronounced than before. The true condition of the peritoneum was not appreciated at this time. The patient did well for 3 weeks, but then again developed symptoms of obstruction and a third operation was undertaken. When the abdomen was opened, the small intestine was found attached to the inguinal colostomy incision at the point where the peritoneum could not be made to cover it. This attachment was so firm that the bowel was torn completely across in an effort to separate it, and it was necessary to resect about 6 inches of intestine and make an anastomosis with a Murphy button. In order to get around the mass of adhesions about the pylorus which involved the stomach, gallbladder, duodenum, and pancreas, a gastroenterostomy was done, though with great difficulty, as the stomach was contracted to about the diameter of the large intestine and was enormously thickened so that the shank of the Murphy button was scarcely long enough to reach through and lock, and the purse-string suture in the stomach-wall could not be made to pucker the tissue about it. Much difficulty was again encountered in closing the wound in the peritoneum. The patient died 14 hours after this operation. A partial necropsy was allowed, and the following pathologic conditions were found: There was a general shrinking, thickening, and contraction of the peritoneum everywhere, but it was most marked in the regions indicated as the favorite sites of the disease—*i. e.*, about the pylorus and gallbladder, the flexures of the colon, the rectum and pelvic organs, the mesentery, and the peritoneum covering the posterior wall. There were no ascites and no serofibrous or fibrinopurulent exudation on the peritoneum. The stomach-wall in places was more than half an inch thick. The adhesions of neighboring organs were quite inextricable. The pancreas was almost cartilaginous in consistence. Numerous bands of contraction were found in the small bowel as well as in the rectum. The right kidney, which had been fixed at the first operation, was so firmly attached as to make its removal almost impossible. Both kidneys showed cystic degeneration or hydronephrosis, due to pressure on the ureters by the shrinking fibrous posterior peritoneum. The liver and spleen were normal, though the superior surface of the liver was adherent to the diaphragm. At the side of each of the former incisions through the peritoneum the viscera were firmly adherent to the cicatrix. Incidentally, it may be mentioned that for about 15 years this woman had a peculiarly dry,

wrinkled, and shrunken skin, with almost a complete arrest of secretion from its glands, coincident with the development of the first abdominal symptoms, which may have been a part of the general pathologic process.

A complete discussion of **sarcomas of the alimentary canal** is presented by Corner and Fairbank,¹ who report a case of **sarcoma of the colon with intussusception**. There have been recorded only 5 cases of intussusception complicating sarcoma of the alimentary canal, and this case is the only one in which the condition occurred in the colon. Also it is but the eleventh case of sarcoma of the colon recorded. The patient was a boy 9 years of age. He was admitted for an intussusception of the colon. When the intussusception was reduced, there was discovered a sessile tumor originating in the submucous tissue of the ascending colon. The tumor was about 1½ inches in diameter. After the bowel was incised it was cut away with scissors and thought to be adenomatous. The patient made a prompt recovery, but Shaddock, who examined the growth, pronounced it a round-celled sarcoma. Nine weeks after the operation the patient was readmitted to the hospital with a tumor as large as an orange, and freely movable, under the right rectus muscle. The abdomen was again opened, and a portion of the ascending colon containing the tumor excised. Two enlarged glands could be felt near the vertebral column and these were removed. The patient died from shock 30 hours after the operation. The authors have collected 175 cases of primary sarcoma of the alimentary tract as a basis for their study. These did not include sarcomas of the pharynx, mouth, or anus. They first discuss the condition generally, and then its manifestations in the various portions of the alimentary tract. Males are more commonly affected than females, in the proportion of 2 to 1. It may occur in any part of the alimentary canal at any age. Of the ileocecal and colonic cases, a large proportion occurs during the first decad of life. About 70 % of the cases occurred in the stomach and small intestine. Sarcoma does not seem to show the same predilection for points of friction or irritation as carcinoma does. The 175 cases collected by the authors are distributed as follows:

| | |
|-----------------------|-------|
| Esophagus | 14 |
| Stomach | 58 |
| Small intestine..... | 65 |
| Ileocecal region..... | 20 |
| Large intestine..... | 11 |
| Rectum | 7 |
| | <hr/> |
| | 175 |

Among the symptoms is intestinal obstruction, which occurred in at least 25 % of the cases. Pain of varying degrees of severity occurs in the majority of cases. Vomiting is recorded in 51 of the cases; and regular fever occurred in 25 cases, and does not seem to depend in every case upon the presence of ulceration of the tumor. Excluding the cases of intussusception, hemorrhage by the rectum occurred only 9 times.

¹ Practitioner, June, 1904.

Excluding the esophagus and rectum, a palpable tumor was found in 56 out of 152 cases. The following points are mentioned as aids to the differential diagnosis of sarcoma and carcinoma: 1. The age of the patient. 2. The more rapid course of the disease in sarcoma. 3. The presence of a tumor of considerable dimensions. 4. The early occurrence and the severity of anemia and wasting. 5. The almost constant presence of pain, often severe. 6. The absence of hemorrhage. 7. The presence of irregular fever.

Sarcoma of the alimentary canal may be annular or may occur as a plaque or polypoid mass, projecting into the lumen of the bowel. It has been stated that sarcoma tends to produce a dilation of the lumen rather than stenosis; this may be true if by stenosis is meant the actual shortening of the internal circumference of the tube, but the caliber of the tube may be obstructed by the size of the mass in spite of dilation around the tumor. Intussusception occurred 6 times in this series—3 times in the small intestine, twice in the ileocecal region, and once in the colon. Glandular involvement was found in one-third of the cases. The liver and kidneys were most often infected with secondary growths. All varieties of sarcoma are found in the alimentary canal, but the round-celled type is by far the most common. Lymphosarcoma and spindle-celled sarcoma come next in the order of frequency. There has been a great deal of confusion in the literature between lymphosarcoma and round-celled sarcoma. The following facts are considered significant: "1. Five of the patients with sarcoma of the stomach suffered from gastric symptoms for some years before the onset of severe symptoms. In one case it is hinted that the growth commenced in the scar caused by a bullet-wound received some years previously. 2. Two of the cases affecting the ileocecal region, not the appendix, had attacks resembling appendicitis for some years previously. In one appendicular case a fecal concretion was present. 3. In 3 of the 7 rectal cases the patients had suffered from hemorrhoids for some years. These facts seem to suggest that, as irritation, in its widest sense, is a cause of carcinoma, so may irritation in the connective tissue be an initial or local factor in the production of sarcoma. Irritation of epithelium leads either to its death or to cell-division; irritation of connective tissue produces similar results *plus* the occurrence of inflammation. In this way young connective tissue is formed, and may be the birth-focus of a sarcoma."

In the recorded cases excision of the growth with or without resection of the gut was performed 51 times, 34 patients recovering from the operation; of these, 6 are recorded as being free from recurrence after periods extending from 1 to 9 years; 12 others are reported as being well from 3 to 8 months after operation.

In a clinical lecture on **carcinoma of the colon** the late William J. Walsham¹ emphasized 3 propositions: First, that the common form of carcinoma of the colon, namely, the columnar-celled variety, is one of the most benign of carcinomas; second, that if this first proposition is correct, the earliest possible diagnosis is of the greatest importance, so that the

¹ Lancet, Oct. 31, 1903.

case may be dealt with while the growth is strictly localized. The third point concerns treatment, and is that when the disease is seen in an advanced stage, the operation should be divided into 2 stages, consisting in a colotomy to relieve the acute symptoms, and later a resection with anastomosis. These 3 positions taken by Walsham are illustrated with the report of case. Early exploratory operation is also recommended by Walsham, who thinks that by its performance the disease may be discovered and treated in its early stages.

Carcinoma of the colon and its treatment by colectomy, with a report of 7 successful cases, is the subject of an article by Bilton Pollard.¹ Carcinoma of the intestine is apparently the least malignant of carcinomas. The growth is slow, and the disease has frequently resulted fatally before secondary deposits have developed. Considering these facts, carcinoma of the colon when diagnosed and treated early offers good grounds for hope of a cure. The results, both immediate and remote, of colectomy for carcinoma when unattended by intestinal obstruction are good. Pollard has performed the operation 7 times; all the patients recovered and all were alive at the time his paper was written, excepting one, who died, 4 years after operation, from heart-disease. The other cases had been operated upon for periods varying from 2 months to 4 years. The difficulty in an early diagnosis lies in the insidiousness of the disease, which often does not manifest itself until it is far advanced. In every chronic illness, however slight, accompanied by dyspepsia a systematic physical examination of the abdomen should be made. A tumor can frequently be found when there are no symptoms to indicate its existence. Among the symptoms of malignant disease of the large bowel one of the commonest is indigestion with great flatulence; constipation with the passage of scyballous masses is usually present; alternating constipation and diarrhea is a well-known symptom. Pain occurs sooner or later, and in many cases is present where there are no obstructive symptoms. Loss of flesh is a marked symptom, and another of even greater value is hemorrhage; this varies greatly in degree, but however slight, it should always excite suspicion. Occasionally the tumor itself is the first indication of trouble noted by the patient. This was so in 3 of Pollard's cases. Attention is called to the ease with which a tumor in the colon can be palpated. Occasionally, if situated in the first portion of the bowel, it may be mistaken for a movable kidney; a displaced kidney, however, can always be returned to its normal position, and this is enough to differentiate the two in most instances. If the kidney is fixed in an abnormal position, there are always evidences of disease of this organ. Adhesion to neighboring organs is not uncommon in cancer of the colon, and the kidney is not the most infrequent, although the gallbladder and stomach are sometimes involved. With regard to the treatment, there are 2 classes of cases to be considered, those in which there is acute obstruction of the bowels and those in which there is no material obstruction. If acute obstruction is present, Pollard advises the withdrawal of the cancerous mass through the ab-

¹ Brit. Med. Jour., Jan. 23, 1904.

dominal wound and the introduction of a tube into the proximal portion of the bowel. If, however, this cannot be executed, the bowel should be opened at a distance from the disease, and when the acute symptoms have subsided, the radical operation should be carried out. In cases in which acute obstruction is not present, Pollard recommends that the incision be made directly over the site of the disease, and before attempting the excision, the surgeon must assure himself that there are no secondary deposits in the liver, and that any glands which may be involved can be removed. Enlargement of the lymphatics does not necessarily mean that they are carcinomatous. The operator also should be assured that the growth is removable before he attempts to remove it. In those cases in which the radical operation of colectomy is impossible, owing to the infiltration of the growth into irremovable structures, or in which it is not justifiable to expose the patient to the risks of colectomy because of the presence of secondary growths incapable of removal, relief may be afforded by the less serious operation of short-circuiting. An important point in the technic is to have the cut ends of the bowel sufficiently mobile to admit of approximation without tension. Because of this necessity often much more bowel must be removed than the disease itself would indicate. For instance, in removal of the descending colon the splenic flexure must always be excised, because it is so fixed that if division of the bowel is made at this point, the upper end cannot be carried down and approximated to the distal portion. Proper attention should also be given to the vascular supply of the bowel at the point of anastomosis. Before resecting, the bowel should be brought outside the abdominal wound, thoroughly surrounded by gauze, and the greatest care must be taken to avoid contamination. Pollard prefers end-to-end anastomosis by means of direct suture to lateral anastomosis and to approximation by means of some mechanic device. In one of his cases the kidney and a portion of the pancreas, which were involved, were removed. Convalescence in 3 of the 7 cases was prolonged by the occurrence of phlebitis. All the cases have been examined recently and there has been no evidence of recurrence in any of them. In 3 sufficient time has elapsed to give good grounds for hope that their cure is permanent. One was operated upon over 4 years ago, another $2\frac{1}{2}$ years ago, and the third 2 years and 2 months ago. The remaining 3 were recent cases.

Homer Gage¹ presents the **surgical aspects of cancer of the intestine**, and reports a number of cases. The cecum is the most favorable locality for operative interference, according to the majority of operators. The general mortality in intestinal resection for malignant disease is probably 50 %, excepting in the neighborhood of the cecum. Regarding the ultimate results of resection, the following figures are given: "Of Körte's 12 successful cases, 5 were well from 3 to $8\frac{1}{2}$ years after operation, 3 of his cases of resection of cecum being alive $8\frac{1}{2}$ and $6\frac{1}{2}$ years respectively. Two of McEwen's cases were alive more and 2 less than 3 years after operation. One of Goullioud's patients was alive 3 years, the others less than 1 year, while Krönlein had 5 cases in which there had been no

¹ Boston M. and S. Jour., Sept. 10, 1903.

recurrence at the end of from 5 months to 14 years. Of von Bramann's cases, 4 had remained well for more than 3 years and 3 for less. Taking the experience of these operators, all of whose reports seem very complete, there were 56 cases, of which 13, or 23 %, had survived the 3-year limit without any evidence of returning disease." Such figures are encouraging and show that when an early diagnosis is made and early operation instituted, these cases offer as much hope as do those of cancer in other regions. The first case reported is that of a man 23 years of age who suffered from acute intestinal obstruction and was operated upon on the tenth day. The obstruction was caused by a polypoid growth, measuring $1\frac{1}{2}$ inches in width, in the lower portion of the jejunum, which had caused some invagination of the bowel with complete obstruction of its caliber. Four inches of the bowel with the growth were excised, and an end-to-end anastomosis was made. The patient died about 3 hours after the operation. An examination of the growth showed it to be an adenocarcinoma. The case is interesting because of the great rarity of malignant disease in this portion of small intestine. A second case is that of a woman 30 years of age who presented symptoms of chronic appendicitis. When the cecum was exposed, it was found to be the seat of malignant disease, and it, together with a portion of the ileum, was excised and an end-to-end anastomosis was made. The growth was an adenocarcinoma. The patient recovered and is well, without recurrence, 2 years and 8 months after operation. A third case is one of cancer of the hepatic flexure producing chronic intestinal obstruction. The disease was far advanced and the patient's condition was very poor. An artificial anus was established after a resection of the diseased bowel. Six weeks later an attempt was made to close the anus, but it was found that recurrence had already taken place in the mesentery and adjacent parts. The patient died a month later. In this instance Gage thinks that he made a mistake in attempting the removal of the growth, and he advises against radical operation unless it is quite evident that the entire growth can be removed. His fourth case has been published (see YEAR-BOOK for 1902). The patient was a man 75 years of age who was operated upon for obstruction of the bowels. He had been operated upon 5 years previously by McBurney, for cancer of the sigmoid flexure. There was no evidence of recurrence at the time of the second operation, and the patient was still well in his eighty-second year, 7 years after removal of the cancer. Gage does not look favorably upon palliative operations, such as the establishment of an artificial anus and short-circuiting, in cases of inoperable cancer of the intestine.

A report of 106 malignant tumors of the intestine is presented by von Mikulicz¹—3 sarcomas of the small intestine, 2 sarcomas of the colon, 1 epithelioma of the transverse colon, 5 carcinomas of the small intestine, and 95 of the large intestine. The higher in the intestinal tract the situation of the tumor, the more pronounced are the manifestations. An intestinal tumor may run a latent course; again it may produce indefinite symptoms; then again it may produce stenosis, and finally ob-

¹ Arch. f. klin. Chir., 1903, Bd. lxxix, Heft 1; Amer. Med., Feb. 6, 1904.

struction. These conditions may all be produced at identical situations in different cases. Ulceration and bleeding usually accompany the condition; bleeding and pus when the tumor is at the sigmoid, as a rule, when the neoplasm is high up. These complications, unless profuse, are often concealed. When peritonitis follows, the infection occurred at the time of the operation, or through an insufficiency of the sutures. The danger of primary peritoneal infection through the opened intestine is greater than is usually admitted. A patient with acute intestinal obstruction is, in consequence of an intestinal intoxication, so devitalized that he cannot resist even a minimum infection. The same is true of chronic obstruction, but in a less degree.

Ewald¹ presents a brief dissertation on **tumors of the sigmoid flexure**. Probably the most common enlargement in this region is due to fecal accumulations. Digital examination of the rectum, however, and the characteristic doughy feel of the mass render its recognition easy in most instances. Of the solid tumors, carcinoma is the most common. This condition, however, is frequently allowed to progress to an unwarranted extent, because the attending physician will not make a rectal examination. Instances of mistakes arising from such carelessness are referred to. When carcinoma in the sigmoid is slow in its development and grows to the outside, diagnosis is not usually difficult. In the beginning there are slight disturbances of the stools, constipation alternating with diarrhea being the rule. The stools should be most carefully examined for blood. Often they are well formed and brownish-yellow in color, and yet upon careful examination are found to contain large quantities of blood. When the tumor degenerates, there are large amounts of foul, bloody discharge. At this time there also develops a more or less painful cylindric tumor in the left iliac fossa. There is but slight tenderness or pain subjectively, and the general health is not markedly impaired. When the abdomen is rigid and the patient is not yet emaciated, the tumor, undetectable by ordinary methods, can frequently be felt in a warm bath, which relaxes the muscles. A constant loss of weight for which there is no known cause is most suspicious. In many of these cases obstruction occurs suddenly with all its characteristic symptoms, and is often supposed to be due to volvulus or intussusception. Another group includes those cases in which the neoplasm grows into the lumen of the intestine, drawing the outer wall into it, causing no thickening, and being hardly possible to palpate. Also such growths for a long time may lead to but slight symptoms or no symptoms at all. Chronic obstruction is apt gradually to develop. Another group of cases is much more difficult of diagnosis. It is that in which a cord-like mass can be felt in the sigmoid flexure or descending colon. It may be tender to vigorous palpation when the abdominal walls are thin and relaxed. The cord-like feel disappears when the colon is emptied or inflated. When there are no symptoms of any intestinal disease, it is not difficult to diagnosticate the character of such a tumor-like resistance. It is entirely different when there is a spastic contraction of the colon simultaneously with other symptoms, such

¹ Am. Jour. Med. Sci., Dec., 1903.

as obstipation, irregular movements, pain, and disturbance of the general condition. Under such circumstances one is compelled to think of a malignant growth. Such spasms of the colon may occur as a pure neurosis, either as a sequel of irritation to the celiac plexus or as a symptom of spinal-cord irritation. It may also occur in hysteria or as a reflex in inflammatory or ulcerative conditions of the neighboring organs and other parts of the intestinal tract. Attention is also called to the fact that a swelling of the colon may occur in the left iliac fossa as the result of a tumor situated in another position. Ewald refers to a case of carcinoma of the hepatic flexure with the occurrence of a hard, cord-like tumor of the sigmoid which, on exposure, showed no newgrowth. Reference is made to the fact that not infrequently highly situated hemorrhoids may be the source of continuous bleeding and severe anemia, leading frequently to a diagnosis of malignancy. [Another article on this subject by Ewald is to be found in the *Berliner klinische Wochenschrift*, Nos. 48 and 49, 1903.]

J. Bland-Sutton¹ delivered an address on the **effect of perforation of the colon by small foreign bodies, especially in relation to abscess of an epiploic appendage**. First, attention is directed to the fact that small particles of metal, bone, fragments of wood, and straw are apt to find their way into the intestinal tract with the food. Sutton's remarks have to do with these small bodies, not with the grosser kinds of foreign bodies. He believes that small particles may find their way through the intestinal tract, escape into the general cavity, and become encysted. In the colon they may work their way through the wall and escape into the general cavity or into an epiploic appendage. The latter is believed to be much more frequent when the patients are fat and more of the circumference of the bowel taken up by attachment of the appendage. Two cases are related which illustrate his remarks. The first case was one operated upon in the spring of 1903, the patient being a man 40 years of age. He suffered with pain in the left iliac region, accompanied with local swelling, tenderness, and fever. It was thought that he had an abscess in connection with the descending colon, probably resulting from perforation. When the abdomen was opened, no pus was at first found, but an ovoid body as large as a bantam's egg and quite smooth was found attached to the colon. It was recognized at once as an inflamed epiploic appendage containing a foreign body. When opened, in its center was found a distinctly circumscribed cavity communicating with the lumen of the colon by a narrow passage. It was filled with inspissated fecal matter in the midst of which was detected a sharp foreign body. The sides of the cavity were attached to the peritoneal edges of the wound, and a drainage-tube inserted into it. The remainder of the wound was closed without drainage. About the fourth day fecal matter escaped freely from the wound. After the tenth day, however, the sinus gradually closed. In a previous case, that of a woman 60 years of age, operation was performed for intestinal obstruction associated with a definite lump the size of a bantam's egg in the left iliac fossa. The age of

¹ *Lancet*, Oct. 24, 1903.

the patient, the situation and mobility of the lump, in connection with the frequent passage of liquid feces from the anus, led to the diagnosis of cancer of the descending colon. The mass, however, was much more tender and painful than is usual with a cancer. It was found to be situated on the sigmoid flexure, and its hardness led the operator to consider it malignant. The adjacent walls of the intestine were infiltrated. After a wide resection of the growth the cut edges of the colon were secured in the abdominal incision, and later anastomosed successfully. In the middle of the supposed cancerous mass was found a smooth, hard body lodged in a smooth-walled cavity communicating with the mucous surface of the bowel by a narrow tubular channel. The globular body in the cavity had a fragment of straw for a nucleus. A careful examination of the literature has revealed no cases similar to these. Bland-Sutton strongly believes that it is possible for a small piece of metal to traverse the wall of the bowel and escape into the general cavity and undergo encystment, and expresses, moreover, the belief that so-called disappearing tumors, which have been supposed to be malignant when the abdomen was opened, may in reality be of this nature.

R. W. Murray¹ (Liverpool) reports a case of **idiopathic dilation of the colon occurring in a child**. The symptoms of this condition first presented themselves in the shape of constipation and abdominal distention soon after birth, and constantly required aperients and enemas. The principal symptoms in the history were a painless distention of the abdomen, with attacks of constipation. It is noteworthy, however, that the stools were never scybalous, but always semiliquid. The patient was 2 years old when the surgeon first saw him. It was thought that the condition was one of tuberculous peritonitis. This diagnosis was strengthened by the fact that three months later there was evidence of fluid in the abdominal cavity. Therefore a small opening was made, and only a moderate quantity of fluid was evacuated. No thorough exploration was made at this time. Fifteen months later the patient's condition was worse than at the time of operation, although some temporary improvement had followed operation. The abdomen at this time, when the child was 3½ years old, measured 39½ inches in circumference. It was thought that the obstruction was due to adhesion or kinking, and a second operation was advised. When the abdomen was opened an enormously distended colon presented itself. By the introduction of a rectal speculum the colon was emptied, and the distention was found to be most marked in the region of the sigmoid. The bowel was emptied but nothing radical was carried out at this time. Two months later the abdomen was again opened, and the sigmoid and descending colon were excised, and the transverse colon was anastomosed to the rectum. The child recovered and has not suffered from constipation or abdominal distention since. Although many authorities deny the existence of idiopathic dilation of the bowel, claiming that in every case there is some mechanic interference with the caliber in the region of the rectum or anus, there was certainly no such obstruction in this case, which is thought to

¹ Ann. of Surg., Nov., 1903.

have arisen from some congenital defect in the structure or nerve-supply of the colon itself.

Brown¹ (St. Louis) discusses **penetrating and perforating gunshot and stab wounds of the abdomen**, taking as a basis for his remarks his experience in the St. Louis City Hospital during 3 months. He is a warm advocate of exploration of all wounds of the abdominal wall, and says that where there is a question regarding penetration of the peritoneal cavity, an opening should be made. Occasionally cases occur in which even after cutting down to the peritoneum it is difficult to demonstrate penetration. This is especially true when the wound is made by a bullet of small caliber. In the majority of instances a median abdominal incision has been employed. After opening the abdomen Brown institutes a systematic search of all the abdominal viscera. Irrigation and drainage are also systematically employed. For anastomosis the Murphy button is preferred. An analysis of Brown's cases shows 9 instances of perforating wounds of intestines, with 6 recoveries and 3 deaths. Of the deaths, it will be seen that 1 was due to shock, the injuries being so extensive that patient never reacted. The second patient entered the hospital with general peritonitis, and while a perforation was overlooked, it is probable that the result would have been the same if this injury had been repaired. The third patient died 48 hours after operation for general peritonitis. In this case there were 8 perforations in the small intestine, all within an area of 19 inches. A resection and an anastomosis by the Connell suture were done. Of the wounds of the liver,—5 cases in all,—4 patients recovered and 1 died. This patient died from shock, the result of hemorrhage, 3 hours after operation. In the wound of the pancreas case the patient recovered. Eight cases are also referred to, in which laparotomy was performed and no injury to viscera found. This makes a total of 23 cases, with 19 recoveries and 4 deaths.

M. L. Harris² reports 16 cases operated upon for **penetrating wounds of the abdomen**, and reaches the following conclusions: "1. In penetrating wounds of the abdomen there are absolutely no known symptoms which indicate injury to any of the viscera, except those in connection with the urinary tract, stomach, and occasionally the lower bowel. 2. Except those relating to general shock, all symptoms following such wounds indicate either internal hemorrhage or peritonitis. 3. To wait for symptoms of perforation of the intestine means to wait until peritonitis has developed, therefore—4. Every bullet or stab wound which penetrates the abdominal cavity should be operated on at the earliest possible moment in order to anticipate the advent of peritonitis. 5. No time should be wasted in attempting to demonstrate the presence or absence of intestinal perforation by such means as the rectal insufflation of gases or vapors, or the analysis of recollected intraperitoneally injected air or liquids. 6. It is essential systematically to examine the entire gastrointestinal canal in all cases, regardless of the point of entrance of the wounding body. 7. Whenever the alimentary canal has been perforated, suitable drains (Harris prefers the so-called cigaret drains) should be

¹ N. Y. Med. Jour., Apr. 16, 1904.

² Ann. of Surg., Mar., 1904.

placed either through the operative incisions or counterincisions, as may appear best suited to the individual case."

The younger Senn¹ presents a very complete study of **traumatic intestinal rupture** with special reference to **indirect applied force**. The duodenum, comparatively speaking, is rarely injured, being protected in its deep position. As we proceed downward in the small intestine injury becomes correspondingly more frequent. The large bowel is more or less protected from rupture by its semisolid or solid contents. The stomach is very rarely ruptured by contusions. Speaking in a general way, blows received above the umbilical line are unlikely to cause intestinal injuries. The force of the injury may be either direct or indirect: direct, that is against the abdominal walls, and indirect, when conveyed to the intestine by an impact directed against the buttocks or the lumbar region. The force may also be divided into that of percussion and compression. Although there is only one vulnerating body, the large majority of the traumatic ruptures of the intestine are due to compression, the vertebral column or bony pelvis acting as the opposing body. Undoubtedly, however, rupture may be produced by pure percussion—that is, the impulse of the blow may cause violent momentary vibration in a coil of intestine overdistended with fluid contents and thus cause a rupture. Senn has been able to find 2 authenticated cases of rupture produced by indirect violence. He reports a case of his own occurring in a woman 26 years of age who slipped and fell upon her right buttock shortly after partaking of a hearty meal. There were no immediate alarming symptoms, but in about 6 hours the patient was awakened with severe abdominal pain. Senn saw her the second day after the injury, when she gave all the evidences of a perforative peritonitis with marked distention. When the abdomen was opened, there was a quantity of serous effusion and lymph in the cavity. After a careful and prolonged search a small laceration of the jejunum was discovered. The patient was in a very serious condition at the time of operation, her temperature being $104\frac{1}{2}^{\circ}$ and pulse 140. When the perforation was found, she was nearly pulseless, and after cleansing the abdominal cavity by dry sponging, the perforation in the intestine was sutured in the abdominal wound. The rest of the abdominal cavity was drained with gauze pads. The patient rallied after vigorous stimulation and was in good condition on the second day. For 11 weeks she was fed practically entirely by the rectum, since food taken by the stomach greatly increased the amount of discharge from the fistula and appeared at the opening undigested. Repeated cauterizations did not cause the fistula to close. The patient was in a very emaciated and wretched condition at this time, and the skin about the opening was the seat of marked dermatitis. The abdomen was opened a second time, the bowel separated from the abdominal wall, and the opening in the gut was closed. The patient recovered and rapidly gained in weight and health. Senn has investigated the history of this case very carefully and is convinced that the fall upon the buttock produced the rupture. Enterostomy was performed in this case because of

¹ Am. Jour. Med. Sci., June, 1904.

the very dangerous condition of the patient and because of the paretic state of the bowel.

It has been clearly shown that blows received upon a rigid abdomen are less likely to produce injury of the intestine than those received when the abdomen is flaccid. From a pathologic point of view these injuries may be divided into contusions and ruptures, the latter being either incomplete or complete. Contusions may vary greatly in degree. These are frequent injuries, and in the majority of instances cause no serious complication. However, cases are reported in which, after simple contusion of the abdomen, the patient progresses well for a number of days or even weeks, and then suddenly the bowel perforates. This is due either to infection of the injured bowel or to necrosis the result of interference with the circulation. Senn believes that incomplete ruptures are more frequent than is supposed. The point, however, is a difficult one to prove. Complete ruptures are usually single, but may be multiple, especially when due to the kick of a horse. It is stated that even when there is an extensive complete rupture of the bowel, there is little likelihood of visible fecal extravasation. Regarding the symptoms, shock is the first mentioned and may vary greatly in degree. It is more marked in the cases in which the injury is produced by a sharp blow. The symptoms of shock become merged with those of peritonitis when the rupture is extensive. In those cases followed by immediate extravasation of intestinal contents there is excruciating localized pain, with all the symptoms of perforative peritonitis. Rigidity is at first marked, and later there is distention. Numerous exceptions to this rule have been noticed, however—cases in which patients have followed their occupations for a considerable time after the receipt of injuries producing laceration of the bowel. Senn believes that retroperitoneal emphysema is indicative of an injury to the duodenum or colon. The loss of liver dulness is by no means invariable, especially if the laceration is a small one. Vomiting is considered of the greatest diagnostic importance, although it is by no means absolute evidence of rupture. The prognosis depends upon the extent of the injury, the degree of extravasation, and the time after injury operation is performed. Siegel collected 376 cases, which were operated upon, with a general mortality of 51.6 %. The following figures relative to these cases, however, are significant:

| | |
|--|--------|
| Cases operated upon first 4 hours, mortality | 15.2 % |
| " " " " 5 to 8 hours, mortality | 44.4 " |
| " " " " 9 to 12 hours, mortality | 63.6 " |
| " " " " later | 70.0 " |

Senn advocates very strongly the careful watching of all cases of contusion of the abdomen and the giving of a guarded prognosis. Operation should be performed upon the least suspicion of rupture, and the incision ought to be made in the median line below the umbilicus. If the bowel is paretic and distended, intestinal drainage is of prime importance.

Harte and Ashhurst¹ present a most interesting and complete dis-

¹ Ann. of Surg., Jan., 1904.

cussion of **intestinal perforation in typhoid fever**, based upon a statistical study of 362 cases in which operation was performed. Out of a total of 8881 cases of typhoid fever collected from various sources, it is found that there were 225 perforations, or 2.54 %. In general terms the white race seems more liable to perforation than the negro race. The male sex is more liable to perforation than the female, in the proportion of about 4 to 1. Of 279 cases in which the age is known, over 12 % occurred in patients under 15 years of age. Intestinal parasites may act as a predisposing cause of perforation. Authorities have differed regarding the severity of the disease as a predisposing cause, but the weight of opinion seems to be that a severe attack predisposes. The occurrence of tympany may be looked upon as predisposing to perforation. Among the exciting causes is anything which sets up unusual peristalsis, such as indiscretions in diet, purges, large and forceful enemas, straining, etc. There can be but little doubt that, as a rule, the large perforations occur early in the course of the fever. Occasionally perforation is prevented by adhesion to other portions of the intestine or the omentum. If such adhesion is not sufficient to prevent the perforation and yet is sufficient to prevent a sudden extravasation, an abscess will form.

As to the form of the perforation, the larger circular lesions are generally due to sloughing; the smaller, or cribriform, to ulceration; and the oblong, slit-like perforations have been thought to be due to traumatism. Although the perforation is usually situated opposite the mesenteric attachment, occasionally the ulcer will perforate between the layers of the mesentery and a retroperitoneal abscess will be found. Such a lesion may be mistaken for a suppurating mesenteric gland. The perforation is usually single. In 271 cases in which this point is mentioned, a single perforation occurred in 236 and multiple perforations in 35. The site of perforation is mentioned in 190 cases, and in 140 of these the lesion was found within 12 inches of the cecum, and in only 4 was it more than 3 feet distant from the ileocecal valve. Meckel's diverticulum was perforated 3 times and the appendix 8 times. The authors have excluded perforations of the appendix in which the lesion was not undoubtedly proved to be of typhoid origin. Frequently the perforation is to be seen only after a patch of lymph has been removed from the bowel, the perforation then appearing as a dark spot in the center of an intensely congested area. Adhesions are usually absent, and when present, are indicative of mixed infection. When streptococci or staphylococci abound, the lymph is more abundant and adhesions are the rule if peritonitis has lasted for more than a few hours. The symptoms of a typical case are well marked and easily distinguished, but, unfortunately, typical cases are uncommon. It is well known both that a patient who has presented all the clinical evidences of a perforation may submit to laparotomy and no perforation nor even a trace of peritonitis be found; and that, on the other hand, patients may die without any abdominal symptoms of importance and a perforation be found postmortem. The symptoms should be carefully studied and the diagnosis made by both the physician and the surgeon. Sudden acute pain is the most valuable diag-

nistic symptom. It is of a stabbing character, and is most frequently located in the right lower quadrant of the abdomen, though it may be felt in the epigastric or umbilical regions and not infrequently in the bladder or at the external urinary meatus. The authors believe that a fall of temperature is the rule immediately after a perforation. A fall in those cases in which several drops of temperature have occurred within a day or two of the suspected perforation is not so significant. It must be remembered also that a fall of temperature may be due to hemorrhage. Rigidity is a very valuable sign. The authors, however, call attention to the different meanings attached to this word by physicians and by surgeons. The "rigidity" of the surgeon is involuntary, reflex, and not produced by palpation, and is most frequently observed in the right rectus muscle. The fact that pleural irritation may produce rigidity of the abdominal muscles led to an error in one of the authors' cases, in which, because of evidences of a pulmonary lesion, operation was not done until after the establishment of general peritonitis, when it was too late to be of value. Increased pulse-rate is a common symptom and carries with it considerable weight. Not until peritonitis is well advanced does pure costal breathing develop. The facial expression in these cases, although indescribable, is of great value to one familiar with it. A great deal of weight is not attached to the ordinary leukocyte count, the authors stating that the whole question is as yet undecided, the accurate observations being still too few to draw any definite conclusions.

In dealing with the differential diagnosis it is shown that most of the conditions from which perforation must be differentiated require the opening of the abdomen, and that, therefore, too much time should not be wasted in the differentiation. Even in hemorrhage, when it is severe and threatening life, the authors believe that abdominal exploration with ligation of the bleeding point is indicated, and in fact they have done it in one case.

In discussing the prognosis it is shown that only 5 of the patients operated upon are known to have died before the conclusion of the operation. Of those that died, 21 lived 2 days, 23 lived 3 days, 21 lived 5 days, 7 lived nearly a week, while 11 lived over a week, 3 over 2 weeks, and 4 over a month; certainly in these last 18 cases the patients may be said to have recovered from the operation. Briefly stated, the most favorable cases have been those in girls 10 to 15 years of age, the perforation occurring in the first week of the disease, when the constitution is still strong, or in convalescence, when the frame is already reestablished; who have been operated on in the third hour after perforation, the single perforation being pin-head in size (under $\frac{1}{8}$ of an inch in diameter), within a few inches of the cecum, or in the appendix; and where neither fecal extravasation had occurred nor adhesions were present. Such would be ideal cases, and the mortality should be less than 50 %. The question of treatment is very thoroughly dealt with. A preference for ether anesthesia is shown, although it is admitted that in the hands of some local anesthesia had been very satisfactory and especially so for the

simple opening of the abdomen and confirmation of the diagnosis. Stress is laid upon the great necessity for speed in this operation. The incision is best made to the right of the median line, through the rectus muscle. Examination should first be made of the small intestine near the cecum and of the cecum itself. If the peritonitis is fairly well localized, the affected area should be walled off by a large gauze pad. If, after the perforation is found, the bowel is much distended with gas or fecal matter, it is well to empty this through the perforation outside of the abdomen. Excision of the ulcer is not only useless but harmful. The authors prefer to close the perforation by sutures of silk. If the perforation is too large to be closed by suture, it is believed best to isolate the coil of bowel from the rest of the abdominal cavity by gauze pads and establish a fistula. The authors advocate strongly the thorough douching of the abdominal cavity and extensive gauze drainage. If a fecal fistula should develop after operation, it may be regarded as of good prognostic import so far as life is concerned, as in most cases in which it has occurred recovery has taken place. The authors have the following to say regarding exploratory laparotomy when the diagnosis is uncertain:

"Of 26 such operations in which no peritoneal lesions were found, 16 patients eventually recovered; only 10 died—a mortality of 38.46 %. Of the 9 fatal cases in which the duration of life after operation is known, only 3 died in less than 12 hours. Of these 3, 1 (Finney) died from pulmonary embolism following iliac thrombosis; the second (J. F. Mitchell) had had severe hematemesis and enterorrhagia shortly before operation, and was in a very precarious condition; while in the third case (Le Conte), in which the patient lived nearly 7 hours after operation, the toxic state previously existing persisted without material change until death. In these 3 cases local anesthesia was used, and in no way can the exploratory incision be held to have had any connection with the fatal termination."

The following tables have been chosen from among a large number which conclude the authors' very extensive review of this subject:

ANALYSIS OF WHOLE NUMBER OF CASES.

| | |
|----------------|---------|
| Recovered..... | 94 |
| Died..... | 268 |
| Total..... | 362 |
| Mortality..... | 74.03 % |

ANALYSIS ACCORDING TO DURATION OF PERFORATION BEFORE OPERATION.

| Cases operated on. | Recovered. | Died. | Total. | Mortality. |
|--|------------|-------|--------|------------|
| First 12 hours after perforation | 35 | 95 | 130 | 73.0 % |
| Second " " " | 22 | 62 | 84 | 73.8 " |
| Third " " " | 2 | 29 | 31 | 93.5 " |
| Over 36 hours " " " | 18 | 37 | 55 | 67.2 " |

ANALYSIS AS TO THE PERFORATION.

| Number of perforation. | Recovered. | Died. | Total. | Mortality. |
|------------------------|------------|-------|--------|------------|
| Single | 65 | 171 | 236 | 72.4 % |
| Multiple | 5 | 30 | 35 | 85.7 " |

ANALYSIS AS TO THE PERFORATION.—(Continued.)

| Site of perforation. | Recovered. | Died. | Total. | Mortality. |
|---------------------------------|------------|-------|--------|------------|
| Within 12 inches of cecum | 32 | 108 | 140 | 77.1 % |
| “ 24 “ “ | 7 | 32 | 39 | 82.0 “ |
| “ 36 “ “ | 1 | 6 | 7 | 85.7 “ |
| Over 3 feet from “ | 1 | 3 | 4 | 75.0 “ |

Perforation of:

| | | | | |
|--------------------------------|---|---|---|---------|
| Cecum or ascending colon | 1 | 4 | 5 | 80.0 “ |
| Transverse colon | 0 | 1 | 1 | 100.0 “ |
| Sigmoid loop | 0 | 1 | 1 | 100.0 “ |
| Meckel's diverticulum | 1 | 2 | 3 | 66.6 “ |
| Appendix | 4 | 4 | 8 | 50.0 “ |

ANALYSIS ACCORDING TO LUSTRUMS.

| Period of time. | Recovered. | Died. | Total. | Mortality. |
|-----------------|------------|-------|--------|------------|
| 1884-1888 | 1 | 9 | 10 | 90.0 % |
| 1889-1893 | 2 | 14 | 16 | 87.5 “ |
| 1894-1898 | 28 | 72 | 100 | 72.0 “ |
| 1899-1903 | 51 | 115 | 166 | 69.2 “ |

STAGE OF DISEASE IN WHICH PERFORATION OCCURRED.

| Perforation occurring. | Recovered. | Died. | Total. | Mortality. |
|-----------------------------------|------------|-------|--------|------------|
| First week of the disease | 4 | 2 | 6 | 33.3 % |
| Second “ “ | 16 | 43 | 59 | 72.8 “ |
| Third “ “ | 22 | 81 | 103 | 78.6 “ |
| Fourth “ “ | 11 | 33 | 44 | 75.0 “ |
| Fifth “ “ | 5 | 20 | 25 | 80.0 “ |
| Sixth “ “ | 3 | 3 | 6 | 50.0 “ |
| After sixth week of disease | 4 | 12 | 16 | 75.0 “ |
| In a relapse | 8 | 7 | 15 | 46.6 “ |
| In third relapse | 0 | 1 | 1 | 100.0 “ |
| In convalescence | 7 | 4 | 11 | 36.6 “ |

CASES DEVELOPING A FECAL FISTULA AFTER OPERATION.

| Time. | Recovered. | Died. | Total. |
|-----------------------|------------|-------|--------|
| Within 24 hours | 2 | 1 | 3 |
| “ 36 “ | 1 | 0 | 1 |
| “ 48 “ | 1 | 0 | 1 |
| “ 72 “ | 1 | 0 | 1 |
| “ 5 days | 3 | 1 | 4 |
| “ 1 week | 1 | 0 | 1 |
| Over 1 “ | 1 | 0 | 1 |
| “ 2 weeks | 2 | 0 | 2 |
| Time unknown | 2 | 0 | 2 |
| Total cases | 14 | 2 | 16 |
| Mortality % | 12.5 | | |

| Treated by | Recovered. | Died. | Total. | Mortality. |
|--|------------|-------|--------|------------|
| Irrigation and drainage | 46 | 130 | 176 | 73.8 % |
| “ but no drainage | 7 | 15 | 22 | 68.0 “ |
| No irrigation and no drainage | 2 | 0 | 2 | ... “ |
| Wiping and drainage | 12 | 19 | 31 | 61.0 “ |
| “ but no drainage | 0 | 2 | 2 | 100.0 “ |
| No wiping and no drainage | 2 | 2 | 4 | 50.0 “ |
| Drain, no wiping nor irrigation | 10 | 7 | 17 | 41.0 “ |
| Wiping, irrigation, and drainage | 1 | 10 | 11 | 90.0 “ |
| Eventration | 3 | 8 | 11 | 72.0 “ |
| False anus established | 0 | 4 | 4 | 100.0 “ |

ANALYSIS OF MISCELLANEOUS LAPAROTOMIES DURING TYPHOID FEVER.

| Operations for | Recovered. | Died. | Total. | Mortality. |
|--------------------------------------|------------|-------|--------|------------|
| Appendicitis | 12 | 4 | 16 | 25.0 % |
| Disease of gallbladder | 4 | 8 | 12 | 66.6 " |
| Abscess of liver | 1 | 1 | 2 | 50.0 " |
| Diseases of pelvic organs | 5 | 0 | 5 | — |
| Suppurating mesenteric glands | 0 | 3 | 3 | 100.0 " |
| Intussusception | 0 | 1 | 1 | 100.0 " |
| Chronic intestinal obstruction | 1 | 0 | 1 | — |
| Peritonitis of unknown cause | 2 | 1 | 3 | 33.3 " |

DURATION OF AFTER-TREATMENT IN FATAL CASES.

| Time. | Cases. | Per Cent. of Whole Number. |
|-------------------------|--------|----------------------------|
| Died on table | 5 | 2.1 |
| “ under 1 hour | 11 | 4.8 |
| “ “ 4 hours | 20 | 8.8 |
| “ “ 8 “ | 24 | 10.4 |
| “ “ 12 “ | 29 | 12.6 |
| “ “ 18 “ | 15 | 6.5 |
| “ “ 24 “ | 18 | 7.8 |
| “ “ 36 “ | 17 | 7.4 |
| “ “ 48 “ | 21 | 9.1 |
| “ “ 72 “ | 23 | 10.0 |
| “ “ 5 days | 21 | 9.1 |
| “ “ 1 week | 7 | 3.1 |
| Lived over 1 “ | 11 | 4.8 |
| “ “ 2 weeks | 3 | 1.3 |
| “ 30 days or more | 4 | 1.8 |
| Total | 229 | 100.0 |

[In a recent case one of us (Da Costa) closed a perforation in the lower ileum and found several other ulcers about to perforate. The bowel was in such a serious condition that resection was indicated, but the patient's condition did not admit of it. An artificial anus was made, and the patient recovered. We would suggest this expedient as occasionally necessary. At least one of the ulcers perforated in this case several days after the operation, but no harm resulted.]

Elsberg¹ presents a full description of the surgical features of perforation of the intestine in typhoid fever in children, reporting a successful case of his own and presenting a table of 25 cases. In this table there were 16 recoveries and 9 deaths. His own patient was a child, 6½ years of age, and the perforation occurred on the thirty-third day of the disease. This child is the youngest on record that has been operated upon for typhoid perforation. The conclusions of his paper are: 1. That perforation of the intestine in the course of typhoid fever is very nearly as frequent in children between the ages of 6 and 15 years as in adults. 2. The symptoms do not differ essentially from those of adults. 3. Although recovery may, in exceptional cases, take place without operation, the treatment should be a surgical one as soon as the diagnosis has been made. 4. The prognosis after operation is more than twice as good in children as in adults, and very early operative interference offers the best chances for recovery.

¹ Ann. of Surg., July, 1903.

Eight cases of typhoid perforation subjected to operation with 2 recoveries are reported by Francis T. Stewart¹ (Philadelphia). He also discusses at some length the indications for operation. Pain is a reliable and constant symptom. Occasionally it is violent, usually it is severe, rarely it is mild. As a rule, it is sudden in onset. Tenderness is a more valuable symptom than pain, and is most marked in the region of the perforation—usually in the right iliac region. Rigidity of the abdominal muscles is the most valuable sign of perforation.

In uncomplicated cases of typhoid pain is a frequent symptom; tenderness is common over the ileum, and slight rigidity may be present, but the association of these 3 features is an indication for exploration, and with a fair degree of accuracy they indicate, by their character and extent, the intensity and area of peritonitis. The hardening of the belly-wall, due to meteorism, to emaciation, to the application of cold water, or to associated pulmonary disease, must not mislead the surgeon, who should be familiar with the feel of the abdomen in all stages of the disease. Immobility of the abdomen and thoracic respiration are very important signs. Auscultation rarely reveals a friction-sound, but may elicit the presence or absence of peristalsis, which is of more value from the standpoint of prognosis than of diagnosis. Nausea and vomiting occur in less than 25 % of the cases. A chill at the onset of perforation is not common. The classic symptoms of shock are not so frequent as is generally believed. Sweating is a common symptom. The greatest difficulty in a differential diagnosis is to separate the symptoms of perforation from those of intestinal hemorrhage, especially as these 2 conditions may coexist. A reduction in the number of red cells and in the hemoglobin would point toward hemorrhage, whereas an excess in the number of white cells would incline toward perforation. Obliteration of liver dulness in a flat belly, or resonance over the posterior and lateral area of hepatic dulness in a distended abdomen, and cellular emphysema are the only pathognomonic signs of an opening into the intestine. The former, however, is a late sign, and the latter does not occur in typhoidal perforations. Stewart believes in operation at the earliest possible moment after perforation has been diagnosed, and does not believe in waiting for the subsidence of shock. All cases should be operated upon, no matter how ill they are, as some remarkable recoveries have been reported. A synopsis of the 8 cases reported by him is as follows:

"Sex, 6 males, 2 females. Ages 9, 10, 19, 23, 23, 30, 41, and 42 years. Day of disease on which perforation occurred: 2 on thirteenth day, 1 during second week, 2 during the third week, and 1 during the fifth week; in 2 cases no satisfactory history could be obtained. Number of hours elapsing between the time of perforation and operation: 3 hours in 1 case (recovered), 12 hours in 2 cases, 14 hours in 1 case, 19 hours in 1 case, and 48 hours in 1 case. In 2 cases, 1 of whom recovered, the time elapsing between perforation and operation could not be determined. Pain during the entire course of the disease in 2, absence of pain previous to perforation in 4, unknown in 2. Location of pain in right iliac region in

¹ Am. Jour. Med. Sci., May, 1904.

5, general in 3. In 1 case the pain was reflected to the right shoulder, and in 1 case the pain extended to the rectum and was associated with tenesmus and a frequent desire but inability to defecate. The pain was violent in 1 case, severe in 6, and moderate in 1; in 1 case in which the pain was severe at the onset it disappeared soon after its appearance and remained absent up to the time of operation. The facial appearance was altered in all except the 2 that recovered. Mental hebetude was present in all. Previous bleeding from the bowel was absent in 6 and unknown in 2. Vomiting was absent in 5 and present in 3. Constipation had been present in 2, diarrhea in 4, and 2 unknown. A chill was not noted in any of the 6 cases from whom a history could be obtained. In 1 case the temperature fell 3 degrees to normal, in 5 the temperature remained unchanged, and in 2 the temperature at the time of perforation could not be obtained. The pulse and respirations were accelerated in all. Localized impairment of resonance was not noted in any of the cases. Sweating was present in 6 and absent in 2. Distention was absent in 2 only. Im-mobility of the abdomen and thoracic respiration were present in 7 and absent in 1 case. Friction-sound was not heard in any of the cases. Peristalsis was heard in 1 case, in which the bowels moved twice after perforation and in which recovery ensued. The liver dulness was totally absent in 4, partly absent in 2, and present in 2. Dulness in the flanks was present in 2 cases only. Rigidity was present in all. Tenderness was general in 5 cases and limited to the lower right abdomen in 3. Rectal examination revealed tenderness in the 7 cases in which it was made. The leukocytes in 4 cases were 4000, 7200, 10,000, and 18,000. The diagnosis was made in 5 cases, and the incision was made in the right iliac region; in 3 cases a diagnosis of perforative peritonitis was made and the abdomen opened in the middle line. The perforations were situated in the ileum within 3 feet of the cecum in all cases, and varied in size from a pinhole up to one-half inch in diameter. In 1 case there were 2 perforations. Fecal matter was present in the peritoneal cavity in all except 1 case, in which the fluid was clear and in which recovery ensued. The peritoneum was inflamed in all but 1 case, in which recovery ensued. Mesenteric glands were enlarged in all. In only 1 case was it necessary to tear through adhesions to find the perforation. In all cases a double row of continuous Lembert sutures of silk was employed. All were drained with gauze, surrounded by a rubber dam, except 1 (recovered); in 1 case (died), in addition to the gauze drainage in the primary incision, a rubber tube was brought out through the loin. Ether was used as an anesthetic in all cases except 1, in which the operation was performed under cocain. Five of the cases were admitted to the hospital immediately before operation, and 2 walked about until the time of perforation. Two recovered, 2 died of typhoid (?), and 4 died of peritonitis." The first case reported lived 60 hours after operation; the second, one-half hour; the third, 3 days; the fourth, 8 days; the fifth, 1 hour; the sixth and seventh recovered; and the eighth lived 30 hours after operation.

A case of **volvulus of the omentum** is reported by Francis T. Stewart¹ (Philadelphia). The patient was a man, 35 years of age, who, while in the best of health, was suddenly attacked with severe abdominal pain which began in the epigastrium and which later settled in the right iliac region. This symptom with vomiting kept up for 4 days, when Stewart first saw him. At this time the right side of the abdomen was rigid and the point of greatest tenderness was at the outer border of the right rectus, on a level with the umbilicus. The bowels had moved freely. A diagnosis of acute appendicitis was made and the abdomen opened. The appendix was removed and was found to be practically normal. A mass, which felt like a gauze sponge, was then encountered well above the incision, which had been made through the semilunaris. This proved to be the right lower portion of the omentum, which was gangrenous and twisted on itself through 360°. It was excised and measured 6 inches in length and 3 inches in width. The cavity was flushed with salt-solution and the wound closed, the patient making an uneventful recovery. An examination of the specimen showed no necrosis of the adipose tissue, which was abundant, but the bloodvessels, especially the smaller veins, were the seat of extensive thrombosis. Stewart appends brief reports of 8 other cases of volvulus of the omentum, which are all he has been able to collect from the literature. The omentum was connected with a hernia in 5 of the 7 cases in which a hernia was present. The symptoms in all the cases were acute and pointed to some serious intraperitoneal lesion. The diagnosis was not made in any case. Two were diagnosticated strangulated hernia, 1 irreducible hernia, 4 appendicitis, 1 intraperitoneal abscess, and 1 suppurating ovarian cyst. The tumor could be palpated in 5; in 4 no tumor could be felt. There seems to be no way suggested by which a diagnosis may be reached. A movable, doughy tumor coming on quickly after attempts to reduce a hernia should make one suspicious of omental torsion. A count of the leukocytes may contribute in differentiating this condition from an abscess. The size of the omental mass varied from that of a large fig to the entire omentum, being the size of a man's head. The tip of the omental mass was fixed in 6 cases, thus making an axis on which the omentum might revolve. The cause of torsion was forcible attempts at reduction of a hernia in 4 instances, severe coughing in 1, and unknown in 4. The explanation of the occurrence of this condition in those cases in which the tip of the omentum was not fixed and in which it was practically normal until the twist occurred is difficult to understand. As the result of experiments on animals Payr is convinced that overdistention of the spirally disposed veins of the omentum would produce twisting of that structure. A review of the reported cases impresses Stewart with the great danger accompanying the employment of forcible taxis in reducing a hernia.

A. D. Whiting² (Philadelphia) reports 2 cases of **volvulus of the entire mesentery**. The first case was that of a boy 5 years of age who died, 12 hours after his admission to the hospital, with evidences of

¹ Jour. Am. Med. Assoc., Mar. 19, 1904.

² Am. Jour. Med. Sci., June, 1904.

obstruction. When the abdomen was opened postmortem, it was found that there had been a complete twist of the entire omentum. By lifting the small bowel *en masse* the mesentery was readily untwisted. The second case was that of a man, 34 years of age, who in October, 1902, was operated upon for appendicitis. The appendix was gangrenous and there was an abscess requiring extensive drainage. A fecal fistula existed for a short time after the operation, but closed before the patient left the hospital. After his discharge he suffered from intermittent pain in the right iliac region. In May, 1903, he complained of constipation, loss of appetite, and daily pain in the right iliac fossa. The scar was firm, and there was no evidence of a hernia at this time and no points of tenderness. At 5 p. m. on May 29 the patient was suddenly seized with severe abdominal pain at the site of the cicatrix and was nauseated. This pain continued severe until operation was done at 9 p. m. When the abdomen was opened, extensive adhesions of the small intestine and a hernia at the site of the old scar, which had not been present one week before operation, were encountered. The small intestine, excepting the duodenum and a portion of the ileum, was partially collapsed, lusterless, dusky red in color, and of a doughy feel. The entire small intestine was lifted out of the abdomen and a twist of the omentum discovered, which was easily rectified. The patient made an uneventful recovery.

R. W. Murray¹ (Liverpool) relates a most interesting case of **intestinal prolapse following the establishment of an artificial anus**, in which he performed intestinal anastomosis. The patient was a boy 12 years of age, who, 3½ years before Murray saw him, suffered from an attack of obstruction of the bowels for which he was operated upon, the operation apparently consisting in opening the abdomen in the median line and establishing an artificial anus in the small intestine. Two weeks later the symptoms recurred and a second operation was performed, another coil of small intestine being brought to the surface to the right of the middle line. The patient recovered, but subsequently there took place a most extensive prolapse of the intestine, rendering the condition of the child most helpless and miserable. For 9 months he lay upon his abdomen with the prolapsed intestine in a receptacle. For the past 2 years he was able to get about, carrying the prolapsed intestine in a bag attached to his waist. The prolapsed intestine with its constant peristalsis appeared like 2 large worms attached to the abdominal wall. The patient had had no natural bowel movement for 3½ years. Murray opened the abdomen with the idea of anastomosing the small intestine to the colon. The latter bowel was very much collapsed, but found, after injecting it with air per rectum. An anastomosis was then done between the ileum and transverse colon, after the latter bowel had been completely divided and its distal portion invaginated. The bowels acted naturally 24 hours later. About a year later an unsuccessful attempt was made to get rid of the remaining prolapse by invaginating the bowel and closing the abdominal wall over it. The boy was readmitted to the hospital 12 months after this, suffering from obstruction. It was thought that further

¹ Lancet, Aug. 22, 1903.

operation would not benefit him and he died. At the autopsy it was found that the occluded portion of bowel, namely, about 18 inches of the ileum, cecum, and ascending colon, was enormously distended, filling the greater portion of the abdomen. It was entirely shut off from the remainder of the gastrointestinal tract and filled with offensive, mucopurulent fluid. "The vermiform appendix was represented by a short and thickened stump and 'appendicitis' was no doubt the original source of the boy's troubles. The case demonstrates the danger there is in retaining in the abdomen any portion of gut occluded at each end."

A. A. Strasser¹ reports a case of **Meckel's diverticulum patent at the umbilicus**, and presents a list of 63 cases of this condition, 21 of which have not before been tabulated. His conclusions are as follows: "(1) The condition is one of great rarity; (2) males are more frequently afflicted; (3) careful attention should be paid to any granulations at the navel, before and after the dropping of the cord; (4) it will be wise at all times to remember the possibility of an included bowel and tie the cord at least 2 inches from the umbilical ring; (5) a radical operation is safest, to do away with the possibility of intestinal obstruction through diverticula later in life."

Stewart McGuire² (Richmond) briefly reports 3 cases of **intestinal obstruction from Meckel's diverticulum**. The symptoms, pathologic condition, and physical signs were the same in all cases. The patients were men between 20 and 30 years of age. The symptoms were those of sudden abdominal pain followed by obstruction, distention, and peritonitis, the patients being brought to the hospital practically moribund from sepsis. A diagnosis of fulminating appendicitis was made in each case. All were operated upon and all died. Free bloody serum was present, the diverticulum was gangrenous, originated from the ileum, was attached by its tip to the mesentery, and had under it an incarcerated coil of small intestine in each case. One of the diverticula measured 7 inches in length and 1 inch in its smallest diameter, and at its tip was a sacculated cavity.

John H. Gibbon³ (Philadelphia) reports a case of **obstruction of the bowels with peritonitis due to a strangulated Meckel's diverticulum**. The patient was a girl, 10 years of age, who was admitted to the Pennsylvania Hospital with all the evidences of an extensive peritonitis and obstruction of the bowels. The patient's temperature was 103° F. and her general condition was very bad. The distention of the abdomen was marked. It was thought that she was suffering from a general peritonitis due to perforative appendicitis. The pelvis and the whole abdominal cavity were filled with a seropurulent exudate, and the small intestine was enormously distended. Much plastic lymph was adherent over the intestines. Upon separation of the adhesions a Meckel's diverticulum measuring 2½ inches was encountered about 2 feet from the cecum. At its extremity was a fibrous band, which was traced in the direction of the umbilicus and then broken. The caliber of the diverticulum was the

¹ Med. Rec., Dec. 12, 1903.

² Virginia Med. Semi-Monthly, Feb. 12, 1904.

³ Am. Jour. Med. Sci., November, 1903.

same as that of the bowel. It was very much inflamed and threatened perforation at 2 points. An absolute obstruction of the bowel at the point of attachment was caused by the diverticulum. After excision of the diverticulum the whole small intestine was withdrawn from the abdominal cavity and a prolonged and thorough irrigation with salt-solution done. The pelvis was drained by gauze and also a gauze drain introduced down to the point of attachment of the diverticulum, as the bowel in this position was of a questionable character. The patient did well until one week after the operation, when there was some accumulation of pus in the pelvis requiring ether for its evacuation. The patient then made a satisfactory recovery and has remained well ever since. Gibbon discusses freely the recent literature on this subject, showing the frequency with which diverticula are now encountered. A. E. Halstead's contribution on this subject (see YEAR-BOOK, 1904) is frequently quoted. Cases of hernia of diverticula have been reported and also cases of marked distention of the sac from twists or kinking. As a cause of intussusception this condition is well known. Meckel's diverticula have also been perforated by typhoid ulcers. Not infrequently the diverticulum is patulous at the umbilicus, and through it may be prolapsed a portion of the small intestine. The diagnosis of obstruction or peritonitis due to Meckel's diverticulum is next to impossible, although visible peristalsis and localized meteorism may be looked upon as suggestive. Even when the abdomen is opened, the condition may be overlooked unless it is borne in mind by the operator.

Clinton¹ (Buffalo) reports a case of **acute intestinal obstruction due to perforation of an inflamed Meckel's diverticulum**. The patient was a man 44 years of age who was operated upon 53 hours after the onset of symptoms. During this time there was no movement of the bowels, the abdomen was distended and tender, and the patient complained of great general abdominal pain. It was thought that the patient was suffering from a perforative appendicitis with an advanced peritonitis. The abdomen was therefore opened over the cecum, but the appendix was found normal. A mass of adherent omentum could be felt near the middle line in the upper portion of the abdomen. The first wound was closed and another made over the mass, which was found to be made up of small intestine and omentum. When the adhesions were separated, a quantity of pus was evacuated and a perforated Meckel's diverticulum, measuring $2\frac{1}{2}$ inches in length and $1\frac{3}{4}$ inches in diameter, was discovered. The bowel to which it was attached was so much inflamed that a resection of 8 inches was found necessary. The diverticulum was perforated near its base. An end-to-end anastomosis of the bowel was made by means of a Murphy button and a small drain introduced. The patient made a rapid and uneventful recovery.

Sailor and Frazier² record a case of **strangulated Meckel's diverticulum in typhoid fever**. Some time before the patient developed typhoid fever he had an attack of abdominal pain which was thought to be due to gallstones. During the course of the typhoid he developed acute

¹ Buffalo Med. Jour., June, 1904. ² Univ. of Pa. Med. Bull., Nov., 1903.

abdominal pain in the region of the umbilicus. The abdomen was opened and a Meckel's diverticulum, which was twisted upon itself and adherent to the parietal peritoneum, was found. It was amputated and the stump invaginated. There was no perforation of the diverticulum. The gangrene was due to twisting of the pedicle. The patient died, 18 hours after the operation, from peritonitis. The authors believe that the twisting of the diverticulum and its adhesion to the abdominal wall took place during the attack which occurred previous to the typhoid fever, and that during the latter disease an infection of the diverticulum occurred.

Rebentish¹ also reports a case of **inflammation of a Meckel's diverticulum producing obstruction of the intestinal lumen**. He has collected 11 cases from literature, 3 of which were discovered at autopsy and 8 at operation. In his own case there was an empyema of the diverticulum and obstruction of the bowel, necessitating the resection of 28 cm. of the ileum. The similarity between this condition and appendicitis is referred to and the term "diverticulitis" is suggested.

Dineur² reports a case of **inflammation of a Meckel's diverticulum producing peritonitis, obstruction of the bowels, and death**. No operation was done. The true condition was found at the autopsy. The diverticulum was 3½ inches in length, 2 inches in width, and was attached 12 inches from the ileocecal valve. It contained a brown, fetid liquid containing colon bacilli. The bacilli when injected into guineapigs produced rapid death.

E. Oliver Ashe³ reports a case of **gangrene of Meckel's diverticulum** occurring in a boy. After the onset of symptoms the patient was carried 60 miles by wagon and 40 miles by train. The abdomen was greatly distended at the time of operation, but when it was opened, a diverticulum 3 inches long was attached to the ileum, 4 inches from the cecum; the distal half of the organ was gangrenous. It was excised and the opening closed. Death occurred six hours after the operation, due partly, it is thought, to the exhausted condition of the patient.

Edred M. Corner⁴ (London) presents an extensive paper on the **pathology and classification of intussusceptions**, with a résumé of those arising from the appendix cæci. A summary of the first part of his paper is as follows:

"Reason has been found to suggest that—1. Double intussusceptions are more common than single. 2. Ileocolic-colic intussusceptions are the most common of all; enteric-ileocecal or colic-ileocecal next. 3. The single ileocecal variety is decidedly uncommon and found principally, or nearly entirely, in chronic cases. 4. The ileocolic is the most common variety of primary intussusception. 5. The inversion begins laterally and most frequently in the last part of the ileum, which becomes engaged in the jaws of the ileocecal valve. 6. The so-called ileocecal forms probably arose in the last half-inch of the ileum or the caput coli. 7. The evolution of the enteric invagination at the ileocecal valve constitutes the

¹ Arch. f. klin. Chir., 1903, Bd. lxx, Heft 4; Amer. Med., Jan. 30, 1904.

² Jour. Med. de Bruxelles, Nov. 5, 1903.

³ Lancet, Aug. 29, 1903.

⁴ Ann. of Surg., Nov., 1903.

chief difficulty in the reduction of the last part of the invagination, frequently rendering traction necessary. 8. That both in man and animals the ileocecal valve is practically never primarily responsible for the trouble." Intussusception of the appendix is probably not so rare as was at one time thought. Corner has been able to discover reports of 16 cases. One of the most interesting is that reported by Rolleston, in which, at a postmortem examination of a woman who died of peritonitis secondary to the perforation of a duodenal ulcer, there was found a marked prolapse of the mucous membrane of the appendix, in which there was inclosed a large concretion. It is thought that the concretion probably in this case was the exciting cause of the intussusception. Sooner or later an intussusception of the appendix is apt to be followed by an intussusception of the cecum. Clinically these cases are very chronic and reduction is usually impossible. In no case had the inversion caused the appendix to slough. In none of the cases was there a history of previous inflammation of the organ. It is not thought that appendicitis is apt to produce the condition, but, on the contrary, by forming adhesions to the surrounding structures, it is more apt to prevent the condition. The following summary is made of Corner's discussion of intussusception associated with Meckel's diverticulum: "(I) When the process opens at the umbilicus as well as into the small intestine. (II) When it is only in connection with the intestine. This is the larger group. (I) The first group may be subdivided as follows: (A) An enteric intussusception formed above the process traverses it, and is extruded at the umbilicus. (B) The ileum opposite the internal opening of the diverticulum becomes protruded at the umbilicus. (a) As a result of prolapses of the diverticulum. (b) Primary extrusion of this part of the ileum. (C) The intussusception begins in the diverticulum itself. (II) The inversion of the diverticulum in *acute* cases is associated with an enteric intussusception; the gut grasping the process is forced onward—propulsion. In *chronic*, the inverted process inverts the ileum behind it by dragging—traction. In *acute* attacks on a chronic, both these traction and propulsion enteric invaginations may be present. The most common triple and quadruple intussusceptions are associated with the inversion of this process."

F. C. Wallis¹ reports 4 cases of **acute intestinal intussusception**, all of which recovered after operation. Each of these cases was operated upon as soon as the condition was recognized, and no attempt was made by other means to reduce the intussusception. Wallis believes these other methods should no longer be attempted and "*should not be taught.*" They rarely or never accomplish any good, and usually result in the loss of valuable time, aside from the immediate danger of rupture of the intestines, etc. In operating upon these cases Wallis pays no attention to the thickened and inelastic condition of the invaginated bowel, which rapidly recovers after reduction. The average duration of each operation in these 4 cases was 11 minutes. Feeding was commenced promptly in all the cases. The youngest child was 6 months of age and the oldest 2

¹ Lancet, June 11, 1904.

years and 3 months. Early diagnosis is a most essential point for the successful treatment of this condition. It is not necessary to wait until the tumor can be felt, vomiting and the passage of blood-stained mucus coming on suddenly in an otherwise healthy child being sufficient indications for an anesthetic to be given. When the abdominal walls are relaxed, a tumor can be felt. [Recently one of us (Da Costa) operated for acute intussusception, and found iliac intussusception, volvulus of the involved area, and gangrene. Resection was performed, but the patient died.]

Wallis¹ also reports a case of **chronic intussusception** in which he successfully excised 42 inches of small intestine. The patient had suffered for more than 2 years from attacks of abdominal pain which, toward the latter part of this period, grew more severe and more frequent. Vomiting was a constant accompaniment. The patient, however, never passed blood or mucus. The earlier attacks were accompanied by diarrhea. Between attacks the woman was in perfect health. During the attacks the abdomen never became swollen and there was no localized tenderness. When chloroform was administered, a mass could be distinctly felt in the neighborhood of the umbilicus. When the abdomen was opened, this proved to be an intussusception involving the small intestine only. Reduction was impossible, the bowel being very friable. A resection was done, and an anastomosis made with the Murphy button. The patient did well until the end of the third week, when she was seized with an attack of pain quite similar to the previous ones. Under chloroform anesthesia the button could be distinctly felt through the abdominal wall. It was pushed further down into what was supposed to be the descending colon. No button passed as the result of this, however, and the pain continued. Four days after the onset of this pain the abdomen was reopened and the button found 4 inches above the ileocecal valve. The intestine was closed after the removal of the button and the patient made an uninterrupted recovery. Wallis states that the button's failure to pass was attributed to the fact that he inserted a larger button than should have been employed. He has used the Murphy button many times, and this is the only time he has had any difficulty with it. Among the interesting points in this case is the large amount of small intestine which was involved. Most cases of chronic intussusception occur in the large intestine. No cause for the condition could be discovered.

Erdman² (New York) deals with the subject of **intussusception**. Increased experience impresses him more and more with the necessity of early operation in this condition, and of the futility of temporizing with air-inflation or water-injection. It is believed that the text-book symptoms of intussusception should be rewritten and the greatest stress laid upon blood and bloody, mucous stools, and not upon the presence of a sausage-shaped tumor. Erdman has seen 26 cases of intussusception and operated upon 23, and in 60 % of these no tumor of any kind was palpable either by rectum or through the abdominal wall. In every instance,

¹ Lancet, Dec. 5, 1903.

² N. Y. Med. Jour., May 14, 1904.

however, there was blood or bloody mucus in the stools. "Sudden pain is almost invariably the first symptom that the child manifests, then a degree of shock varying in intensity, and efforts at defecation take place; these are followed by manifestations of spasmodic pains; a peculiar whining cry or fits of crying." At first the abdomen is lax, but in a few hours it is apt to become distended and evidences of complete obstruction occur. There are invariably an accelerated pulse and elevation of temperature from 1° to 2° . Rectal enemas in the first few hours are not productive of harm, but should not be given after the elapse of 6 hours, when only operative treatment should be considered. Attention is called to the fact that the effect of high enemas is frequently deceiving, as they may only partially reduce the intussusception. Erdman would not feel satisfied that reduction had taken place unless the subsidence of pain was followed in a short time by a free movement of the bowels. Enemas given just previous to operation may accomplish a partial reduction of the intussusception and save time after the abdomen is opened. The success of the operation will depend largely upon its duration. Chloroform is the anesthetic preferred by Erdman. He invariably makes a median incision. Traction as a means of reduction should never be used except in the lightest possible manner. If the tumor is of considerable size, at least a portion of it should be reduced before delivering it through the wound. This can be accomplished by compressing the distal end of the tumor in the proximal direction. Occasionally a blunt instrument may be used to separate the adhesions which have taken place between the two portions of bowel. Since January, 1902, Erdman has operated upon 11 cases, and in each he removed the appendix before closing the abdomen, as the appendix was a portion of the intussusception. When reduction is impossible, resection should be done and end-to-end anastomosis made when the bowels are of the same caliber. When one is small and the other large, however, a lateral anastomosis should be made. After the operation paregoric in sufficient dose to control peristalsis should be administered every 3 hours. During the past 11 months Erdman has operated upon 5 cases, with 1 death. His paper closes with a description of 2 interesting cases. [The recent reports of cases all go to show the great value of prompt operation in cases of intussusception. Never before have reported cases of this condition shown so low a mortality-rate. A lesson to be drawn from them is early diagnosis and prompt operative treatment.]

A case of **triple telescopic intussusception** originating in a **Meckel's diverticulum** was operated upon by Carwardine.¹ The patient was a child 14 months of age. When the abdomen was opened, an intussusception of the ileocolic variety was encountered. When the ileum was withdrawn from the cecum, it was found that it was invaginated into itself, and when this was relieved, there was found in the apex of the intussusception an inverted Meckel's diverticulum. The patient died soon after the operation. The diverticulum was situated 15 inches from the ileocecal valve.

¹ Lancet, Feb. 20, 1904.

Von Eiselsberg¹ has operated upon 13 cases of **intussusception**—11 adults and 2 children; 7 were chronic, 3 subacute, and 3 acute. He says it is not always possible to differentiate between the acute and the chronic. Twice the invagination was of small intestine only; 10 times it was at the ileocecal valve, and once at the sigmoid flexure. As causes of conditions, he says, there was present polypoid tumor 3 times, carcinoma of the sigmoid once, cicatricial stricture once, lymphosarcoma once, an ulcer at the head of the invagination that proved to be a tumor microscopically, once; in the remaining 6 cases there was an abnormally long mesentery. Pain was present in all his cases; vomiting in all but 3; diarrhea in 9; in 5 of these the stools contained blood; in 4 there was constipation; meteorism was always present; in 10 cases a distinct tumor was palpable; where the sigmoid was invaginated, the tumor was palpable by the rectum. He did 12 total resections; 1 died with gangrene and perforation soon after the operation; 1 died of marasmus 3 weeks, and one 6 weeks, after operation. He prefers total resection, since with simple disinvagination there is a tendency to recurrence.

Under the title of **some unusual cases of intestinal obstruction** R. B. Duncan² describes, among others, a case of **acute ileocecal intussusception** in an infant 7 months of age, in which recovery followed operation. The abdomen was opened 7 hours after the onset of symptoms. The apex of the intussusception extended into the rectum. Gradually, by massage and pressure, it was reduced. The abdomen was closed without drainage and an uneventful recovery followed. Another case of ileocolic intussusception is reported which occurred in a woman 40 years of age and which closely resembled obstruction due to fecal impaction of the cecum. Aperients and enemas were employed for 48 hours without result and but little change in the patient's general condition. With the onset of fecal vomiting operation was insisted upon. Ileocecal intussusception was encountered, and all efforts at reduction were ineffectual. An incision was made in the sheath and the intussusception removed. The bowel was then sutured according to the method of Maunsell. The patient died 24 hours after the operation. A third case of intussusception is reported which involved the sigmoid and rectum. This condition was diagnosed by a rectal examination, but operation was not consented to until after 19 days of complete obstruction of the bowels. At this time only a colotomy was performed, but this, fortunately, resulted ultimately in an absolute cure. When the bowel was first opened, which was done at once, but little relief of the distention followed, but later the distention completely subsided and the patient rapidly improved. He would not consent to a second operation nor would he consent later to rectal examination. The colotomy wound gradually closed and the movements became perfectly natural. It is presumed that the sigmoid sloughed off and was passed through the rectum.

Kempe and Brown³ report a case of **intestinal obstruction** resulting

¹ Arch. f. klin. Chir., 1903, Bd. lxxix, Heft 1; Amer. Med., Feb. 6, 1904.

² Intercol. Med. Jour. of Australasia, Apr. 20, 1904.

³ Lancet, Aug. 15, 1903.

from a kick in the right iliac region. The patient was a boy 17 years of age who was kicked in the abdomen by a horse. He developed all the symptoms of a peritonitis, with marked abdominal distention. In fact, meteorism was the most prominent symptom. It was relieved to a great extent on several occasions by the hypodermatic use of strychnin. At the end of a week distention was so great that the thoracic viscera were markedly displaced by it. His general condition remained fairly satisfactory until the sixteenth day after the accident. The temperature-range had been between 99° and 101° F. After this day the bowels became less and less active and the meteorism increased and could not be relieved. Kempe operated upon the patient, about 3 weeks after the receipt of the injury, because of absolute obstruction of the bowels. When the abdomen was opened there was evidence of a recent general plastic peritonitis, the coils of the intestine being firmly bound together and to the parietes, especially in the pelvis and the right iliac region. There were no free fluid and no collection of pus. A distended piece of gut was opened and a Paul's tube introduced. A large quantity of gas and liquid fecal matter was discharged. The patient greatly improved after the operation, and the abdomen became flat instead of barrel-shaped. The tube was removed on the third day. Eleven days after this operation the patient was admitted to the hospital for the purpose of having the fecal fistula closed. The portion of the small bowel, together with the fistula in the skin, was excised and an end-to-end anastomosis with Bishop's bobbin was done. The intestine below the point of the fistula was very adherent and required considerable work to free it. Two days after the operation the patient was vomiting, the abdomen was distended, and there had been no movement of the bowels. Five days after the operation the patient was much worse, the vomiting being bilious and the bowels not having moved. At this time he was considered moribund. The abdomen was therefore rapidly opened, and into a portion of small intestine a Paul's tube was inserted. On the day following there had been no discharge from the newly made fistula and the patient's condition was even worse. The Paul's tube was removed and 15 ounces of warm water were injected into the proximal side of the fistula. This started up a discharge of fecal matter which became profuse, and the patient rapidly improved. Two months later a fourth operation was done, when the section of bowel containing the fistula was excised, the distal end closed, and the proximal end anastomosed with the ascending colon by means of a Murphy button. The patient made a good recovery and passed the button a week later. Kempe believes that this case was one in which a hemorrhage of the abdominal cavity was succeeded by a plastic peritonitis and intestinal obstruction. There was no evidence of any perforation of the intestine, and it is believed that the source of the bleeding was the parietal peritoneum in the right iliac region, where a scar was found at the second operation. This case demonstrated very clearly the value of enterostomy as a life-saving operation. In spite of the fact that on each occasion the opening was made in the jejunum, the patient improved in condition and put on flesh. Six months after

the patient's discharge from the hospital he was back at his ordinary work and was perfectly well.

Eller (Münster) reports a case of **acute intestinal obstruction caused by syphilitic ulceration in the ileum**. The patient was admitted to the hospital because of a tertiary ulcer on the eyelid. He gave, however, no history of an initial sore. A few hours after admission he developed acute abdominal symptoms and was operated upon for obstruction supposedly due to a perforative peritonitis. The peritoneum contained a moderate amount of turbid, yellowish, seropurulent fluid, in which floated a number of large, jelly-like pieces of fibrin. The appendix was normal. At a point $2\frac{1}{2}$ feet over the ileocecal valve was found the obstruction. Here the ileum was inclosed in a mass of omentum which, when removed, did not relieve the obstruction. The bowel above the constriction was distended with blood. A firm, nodular mass could be felt in the lumen of the bowel. A resection was done with an end-to-end anastomosis. The abdominal wound was closed with drainage. On examination of the resected portion of bowel an old ulcer was found subjacent to the mesenteric attachment. Opposite this was a small abrasion of the mucosa, showing evidence of recent hemorrhage. The patient made an uninterrupted recovery. The ulcer of the eyelid healed quickly and completely under mercurial inunctions combined with potassium iodid. The ulcer in the bowel presented syphilitic characteristics, and there was evidence, microscopically, of an endarteritis. By a discussion of the case it is shown that there could have been no other than a syphilitic cause for this ulcer of the bowel, which, however, is a rare condition.

F. T. Paul² (Liverpool) reports a case of **intestinal obstruction due to a large gallstone**. Enterotomy was performed, the stone removed, and the wound closed. The patient made a good recovery. The gallstone measured $1\frac{1}{2}$ by $1\frac{1}{2}$ inches. It was very soft and friable on the outside, as though macerated in the bowel, but hard underneath.

Clairemont (Vienna), with Ranzi,³ has made an experimental study of the **intestinal poisonings of ileus**, the results of which are summarized as follows: "The intestinal contents above the stenoses, after being rendered free from bacteria by infiltration, always proved poisonous, whether administered intravenously or hypodermatically. Bouillon cultures of small quantities of the intestinal contents after 4 to 5 days gave toxins equally poisonous. Thus the poison is the result of bacterial growth. It can also withstand heat. The toxic action can be paralyzed by mixing the material with the brains of normal rabbits or guinea-pigs. The filtered intestinal contents in some instances showed intense hemolytic power when administered to dogs or horses. It was impossible to establish either active or passive immunity to the poisons, which seems to show that an extension of serum-therapy to the treatment of ileus is impossible."

² Brit. Med. Jour., May 7, 1904.

³ Liverpool Med. Chir. Jour., June, 1904.

³ Proceedings of the German Surg. Congress, 1903, Ann. of Surg., Dec., 1903.

Finney and Pancoast¹ recommend a more **extensive employment of enterostomy** and report briefly a number of cases in which this procedure has been practised. Two very different purposes may be accomplished by enterostomy; they are: 1. To drain temporarily a distended intestine and allow it to regain its normal tone in cases of functional paralysis of the bowel of septic or other origin, especially in those cases following appendicitis with peritonitis. 2. To enable one to nourish a patient whose stomach and rectum are for any reason irritable and unable to retain or absorb a sufficient amount of nourishment.

In many cases of peritonitis, and, in fact, in some cases in which there has been no marked inflammatory condition present, there develops after the operation a marked distention of the bowel, caused by the inability of the gut to reestablish its peristaltic action. If not relieved, this condition progresses and the patient dies. In some of these cases free catharsis results in the saving of life, but this cannot often be brought about either through drugs put into the stomach or by enemas. The authors say that in their experience the administration of cathartics through an intestinal fistula has proved uniformly effectual in exciting peristalsis. Enterostomy can quickly be done under local anesthesia, and the operation may be looked upon as a comparatively slight one. The disadvantages of an intestinal fistula being manifest, it should not be resorted to for the purpose of feeding except under urgent indications. When done with this object, the method of Witzel is the one recommended. In cases of obstruction of the bowels a rectal tube is inserted through the intestinal opening, first in one direction and then in the other, and after the escape of gas and feces the bowel may be irrigated. The amount of fluid which can be given through the bowel fistula is surprising. Purgatives are also well retained and are usually effectual. In favorable cases peristalsis becomes quickly established and the fistula closes spontaneously or can be closed by operation. When the operator anticipates the possible necessity for enterostomy after operations upon the abdomen, a loop of the bowel may be fixed by gauze packing in the wound so as to be readily accessible for subsequent manipulation, guide sutures being inserted into the bowel at the point to be opened.

Enterostomy in peritonitis is discussed by Greenough² (Boston), who, after showing the advantages of drainage of the bowel in cases of extensive peritonitis where paralysis of the bowels is present or is apt to occur, and describing the method of establishing this drainage, reaches the following conclusions:

"1. The obstruction of the intestine in diffuse peritonitis is the result of a combination of causes. 2. The most important cause is suspension or paralysis of peristalsis. 3. Paralysis of peristalsis is due to inhibition, to toxic paralysis, and to the paralysis of distention. 4. Mechanic causes, such as infiltration of the bowel-wall and light adhesions, in certain cases contribute to this paralysis. 5. Pure mechanic obstruction due to adhesions is the result of chronic or local peritonitis of at least some days' duration. 6. Enterostomy is indicated in addition

¹ Amer. Med., Aug. 22, 1903.

² Boston M. and S. Jour., May 19, 1904.

to other operative measures in the graver forms of diffuse peritonitis. 7. Its greatest advantage is the drainage of the gases and decomposing contents of the bowel and the relief of paralysis of peristalsis. 8. By enterostomy the surgeon obtains direct control over the intestine for lavage and for the introduction of stimulants, nourishment, fluids, and cathartics. 9. For the relief of paralysis of peristalsis primary enterostomy is to be preferred to the secondary operation. 10. Enterostomy is best performed by the use of the Mixer tube (Figs. 12, 13). 11. The cecum is the most satisfactory part of the bowel for a primary enterostomy, and the jejunum should be avoided. 12. Spontaneous closure of the fistula may be expected when the cecum is opened, if the opening is kept below the level of the parietal peritoneum. 13. By the systematic use of enterostomy in the graver forms of diffuse peritonitis the number of patients dying on the second, third, and fourth days after operation is reduced. 14. The symptoms of visible peristalsis and spasmodic pain in intestinal obstruction indicate a mechanic cause for the obstruction. 15. The persistence of these symptoms, unrelieved by enemas



Fig. 12.—Mixer tube for enterostomy of cecum. Actual size, about $\frac{1}{4}$ inch in diameter (Greenough, in 'Boston M. and S. Jour., May 19, 1904).

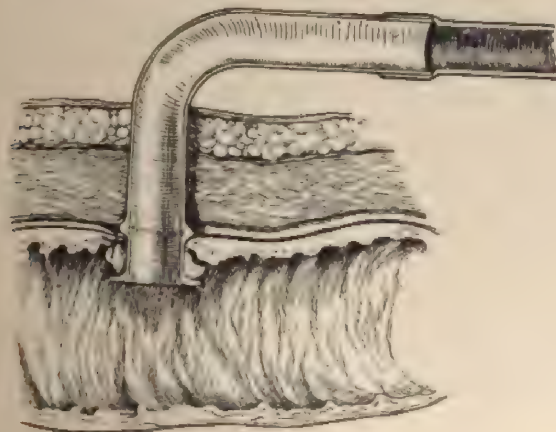


Fig. 13.—Diagram of Mixer tube *in situ*, showing purse-string suture and fixation to parietal peritoneum below abdominal wall. Drawings by Miss Florence Byrnes (Greenough, in Boston M. and S. Jour., May 19, 1904).

and cathartics, is an indication for operation. 16. Under these circumstances the cause of the obstruction should be removed if possible by operation. 17. In advanced cases of obstruction of this form

enterostomy of the coil of intestine nearest above the obstruction should be done." An abstract of 41 cases in which drainage of the intestine was practised at the Massachusetts General Hospital is appended to Greenough's paper.

RECTUM AND ANUS.

Gant¹ (New York) presents a paper on the **nonmedicinal treatment of constipation**. He condemns very heartily the practice of injudiciously prescribing purgatives, cathartics, and enemas when the costiveness is caused by fissure, polyps, hemorrhoids, hypertrophy of the rectal valves, and other conditions requiring operation or local treatment. The giving of these remedies is also a great mistake when the condition is the result of irregular habits, improper diet, insufficient exercise, etc. Gant states that he has not resorted to the use of drugs for the relief of constipation for many years. The principal features of the nonmedicinal method practised by him are "the proper education of the patient, together with the administration of enemas when necessary, massage, the application of electricity, divulsion or division of the sphincter muscle, and valvotomy, any one or all of these simple procedures being carried out as the case demands." Success will depend upon the persistence and care with which this treatment is carried out, and the patient should not expect a prompt restoration of normal physiologic action. This is brought about slowly. The proper education of the patient is most important. One of the simplest and best laxatives is water, taken freely during the day and especially on an empty stomach in the morning. Most important in this treatment is the establishment of a fixed hour for emptying the bowels. Early in the treatment, in order to secure necessary evacuation and relieve impaction of fecal matter, enemas may be used, but should be discontinued as soon as possible. Massage is of the greatest benefit, and electricity also aids. "*Divulsion of the sphincter muscle* is very often necessary in cases of chronic constipation in either adults or children when the muscle has become hypertrophied or irritable, and offers an obstruction to the evacuation of the feces. Many of the writer's patients in whom the muscle has been divulsed or divided during operation for other rectal affections have remarked some time afterward that their constipation also has been cured." In making forcible or rapid divulsion the thumbs are better than the mechanic dilators, as any tearing of the muscle-fibers is easily recognized and avoided. "In some cases the sphincter is so thick and rigid that the necessary amount of relaxation cannot be obtained by divulsion, however thoroughly done, and *complete division* is required." Valvotomy is an operation which is occasionally indicated because of hypertrophy of one or more of Houston's valves. For the performance of this operation Gant has devised a clip or clamp which can be applied to the valve and left in the bowel, in this way gradually

¹ Med. Rec., Oct. 24, 1903.

cutting through the obstruction. The clip is passed with the feces without trouble.

C. B. Keetley,¹ in a communication, suggests the **advisability of treating certain forms of obstinate constipation by enterocolostomy**. In 1901 he suggested this operation to a patient, but it was declined. He believes that the operation of anastomosing the ileum to the sigmoid in a limited number of cases of habitual constipation has its place among the legitimate procedures of surgery.

Martin² (Cleveland) discusses the **relation of the rectal valve to obstipation**. He reports briefly 40 cases which were operated upon 2 years prior to June 10, 1902, to substantiate his views regarding the importance of the rectal valve in the production of obstipation. Of these 40 patients, 2 were unimproved; 5 were improved; and 33 were cured. It is stated that it should be recognized that valvular obstipation may recur from the development of hypertrophy in other rectal valves. With proper care, however, this can usually be avoided. With the return of symptoms the patient should receive the treatment for acute rectitis. The symptoms of hypertrophy of the rectal valve are described as follows: The patient is the subject of more or less chronic obstipation. He makes frequent partially successful attempts at defecation daily, but may experience an unrequited desire for stool. The patient acquires the reprehensible physis habit. In time the periods of obstipation are interrupted by short periods of diarrhea. There is an ineffectual straining at stool, except for fluid feces. Discharge of mucus is usually noticed. Later the diarrhea may occur with greater frequency, and ultimately long periods of diarrhea may ensue, which are interrupted by a transitory constipation and obstipation. All these symptoms may be accompanied by increasing degrees of flatulence and borborygmus, and from time to time the patient is subjected to attacks of intestinal autointoxication, and finally he becomes neurasthenic. On account of the especial non-sensitiveness of the rectal valve the patient's sufferings are not uniformly referred to this region by himself, but in many instances, however, the intelligent patient is prepared to present his physician with a ready-made diagnosis of rectal obstruction. Ultimately the symptoms of intestinal obstruction may become pronounced, and if the patient be unrelieved, the disease proceeds to a fatal termination. Symptoms of pain, aching in the iliac regions, backache and sciatica, hemorrhage, catarrhal or membranous proctocolitis, prolapse, hemorrhoids, fistulas, etc., may be the signs of complications of the obstructing valve, and these may embrace the entire proctica.

J. M. Lynch³ describes an **instrument which he has devised to protect against infection in operations on and around the rectum**. Infection in these cases usually results from the fact that the surgeon finds it necessary to insert his finger into the rectum during its separation from surrounding tissues. Quénu suggested the shutting-off of the rectum by separating the mucous membrane from the skin and tying it off with

¹ Lancet, Dec. 26, 1903.

² Amer. Med., Dec. 5, 1903.

³ N. Y. Med. Jour., July 11, 1903.

a ligature. This, however, does away with the advantage which the surgeon may gain by having a finger in the rectum. Lynch's description of the instrument is as follows: "Two concavoconvex metal rings, a carrier, and condom. The inner ring is perforated with 4 holes, corresponding to the hours of 6, 9, 12, and 3 on the dial of a clock, to enable it to be sutured to the skin in operations on the prostate. The ring is introduced by a carrier which is nothing more than two retractors fastened together like a dilator; this fits into the convex surface of the inner ring, then a condom is fitted on the concave groove of the same ring, and an elastic band is placed around this to keep it in position. The outer ring has a hinge corresponding to the 9 o'clock perforation; and a clasp corresponding to the 3 o'clock perforation is so arranged that it fits exactly the different thicknesses of gut. With the carrier in position and the condom on, the inner ring is now introduced into the cylinder of mucous membrane which has previously been dissected up inside the sphincter; the outer ring is clasped over it, and, with the finger in the ring, the gut can be dissected up above a tumor with the finger in the rectum as a guide, and with no possible fear of infection from the bowel."

Murray¹ (Syracuse) has devised a tube for giving enemas and one for irrigating the rectum and colon. The great advantages of these tubes are their blunt points, the opening on the side, which is unlikely to become obstructed, and the thickness of their walls. The ordinary rectal tube is too thin, and is, therefore, apt to become kinked upon itself very easily, especially after it has been used for any length of time. The irrigation-tube is $\frac{3}{4}$ inch in diameter, and with it Murray states that the sigmoid can very readily be entered. When any difficulty is encountered, however, a proctoscope should be introduced up to the sigmoid and the tube passed through the proctoscope.

Samuel G. Gant² (New York city) describes the use of **sterile water as an anesthetic in the office treatment of rectal diseases**. He finds that the tissues thoroughly infiltrated with simple sterile water are as anesthetic as when cocaine or eucaine solutions are used. Gant began this work in September, 1901, and now uses it to the exclusion of general and medicinal anesthetics, with gratifying results in practically all except capital operations. He uses it, for instance, for fissure, ulceration, protruding or nonprotruding internal hemorrhoids, cutaneous and thrombotic external hemorrhoids, polyps, prolapsus ani, fistulas, marginal and follicular abscesses, and numerous other conditions. The temperature of the water employed is unimportant, though warm water is preferable. The secret of success in the use of the method consists in thoroughly distending all the tissues which are to be divided. In operating upon hemorrhoids each tumor is injected with sufficient sterile water to distend it tightly and cause it to turn white; the hemorrhoid can then be painlessly removed by the ligature, clamp, and cautery, or excision method. The following advantages of the method are recommended:

"1. Effective local anesthesia is so quickly and easily obtained by this

¹ N. Y. Med. Jour., Mar. 12, 1904.

² N. Y. Med. Jour., Jan. 23, 1904.

method that in a majority of rectal and operations in other parts of the body there is no necessity of requiring a patient to submit to the annoyance and expense of entering a hospital and undergoing general anesthesia. For this reason it appeals strongly to the better class of patients. 2. The anesthesia instantly follows the injection of water sufficient to distend tightly the tissues to be incised or removed. This enables the operator to work quickly, and, as the patient is not confined to the hospital during the after-treatment, but can come to the office to be dressed, it economizes the surgeon's time and labor. 3. No annoying or dangerous complications have been observed during or following the injection of the amount of water necessary to produce anesthesia. 4. In Gant's experience the pain and bleeding following this method of local anesthetization have been less than when medicinal local anesthetics have been used. 5. It eliminates the danger to life from complications of the heart, lungs, and kidneys, which are always to be feared during and following the administration of ether or chloroform, and it avoids the increased pain and hemorrhage due to straining and vomiting after general anesthesia. 6. The only requirements are a hypodermatic syringe, a suitable needle, and boiled water, and these are usually at hand. 7. The radical treatment of hemorrhoids can be so easily carried out under this method in the physician's office, with so little danger and inconvenience to the patient, *that it should relegate to oblivion the much-vaunted injection treatment, which is so dangerous and uncertain.*" [We have employed this method and find that it certainly does produce anesthesia. Nevertheless in operating upon internal hemorrhoids and fissures we regard stretching the sphincter as a preliminary measure, a necessary, or at least a valuable, procedure in most cases. This can be done while the patient is under the influence of nitrous oxid.]

J. R. Pennington¹ (Chicago) discusses the **röntgen-ray treatment of pruritus ani**, and reports 13 cases which have been relieved by this treatment. Regardless of what the primary cause may be, there are always more or less infiltration and thickening of the skin surrounding the anus in this condition. This is due to the deposit of an inflammatory exudate and tissue of a low degree of vitality, and to it is attributed the disturbed sensibility of the skin. Knowing, therefore, that the röntgen-ray stimulates the healthy cell and increases its activity, and that it causes degenerative changes and atrophy of inflammatory products, it seems reasonable to employ it in the treatment of pruritus ani. Pennington does not urge this method to the exclusion of all others, but sees no reason why it should not be combined with the others. In none of the cases in which it was employed was there any dermatitis or other ill effect. The skin was left smooth, soft, and pliable. In each of these cases the hair was removed by the röntgen-ray. It is not thought that 13 cases are sufficient to prove the value of the remedy, and yet in these it was most satisfactory. [This is a valuable suggestion and should receive careful trial in these most troublesome and distressing cases.]

A. H. Burgess² (Manchester) reports 2 cases of **incontinence of**

¹ N. Y. Med. Jour., Feb. 20, 1904.

² Lancet, Mar. 12, 1904.

feces treated by the submucous injection of paraffin. The first patient was a man, 58 years of age, who, as the result of 2 operations for fistula in ano, developed complete incontinence of feces. Two subsequent plastic operations failed to relieve the condition. No evidence of the sphincter muscle could be found upon examination, and there was present extensive scar tissue. Under general anesthesia paraffin was injected at several points into the submucous tissue of the rectum, beginning high up. Two injections were made, in all 52 cm. of paraffin being introduced. The patient was heard from 9 months after the operation, at which time he had complete control over his motions, and since the operation had not soiled his linen once. The second case was that of a boy 7 years of age who had been operated upon numerous times for prolapse of the rectum. Four fingers could easily be introduced through the sphincter. At first only 6 cm. of paraffin were injected submucously. This helped the condition, but did not cure it. On the second occasion 27 cm. of paraffin in 3 successive tiers, each consisting of 3 nodules of 3 cm. each, were employed. No prolapse followed this treatment, and the incontinence was greatly improved. However, there was some soiling at night, which a plastic operation completely relieved.

Czerny¹ suggests in cases of less extensive fissure of the anus the thorough excision of the fissure and the mucous membrane by sewing it up in a transverse direction after the same manner as is employed in performing pyloroplasty. The first suture should bring the two apexes of the incision in contact. After closing the wound Czerny introduces into the anus a rubber tube covered with gauze which is rubbed full of boric-acid ointment. It is very important to excise the fissure thoroughly down to the muscle-fiber. When the fissure is complicated by hemorrhoids, the total excision of these with the approximation of the mucous membrane and skin is advised.

A. J. Downes² (Philadelphia) describes the use of the electrothermic angiotribe in the removal of hemorrhoids.

Reinbach³ reports 4 cases of hemorrhoids in children. The ages of the patients were 14 years, 8 years, 3½ years, and 7 weeks. The child of 7 weeks not only was born with hemorrhoids, but presented a number of congenital deformities. Each case was treated differently. Microscopic examinations were made in several of them, and the walls were found to be composed of fibrous tissue containing some elastic tissue and at other times a smooth muscle-tissue. Reinbach considers a hemorrhoid to be a newgrowth. He says the theory "that obstruction in the liver produces hemorrhoids fails when we consider that the inferior hemorrhoidal veins concerned in the production of external hemorrhoids and the middle hemorrhoidal veins concerned in the production of the internal hemorrhoidal are both tributaries of the internal iliac veins. He

¹ *Beit. z. klin. Chir.*, 1903, Bd. xxxvii, p. 765; *Amer. Med.*, Nov. 7, 1903.

² *N. Y. Med. Jour.*, Oct. 10, 1903.

³ *Mitth. a. d. Grenzgeb. d. Med. u. Chir.*, 1903, Bd. xii, Hefte 2 u. 3; *Amer. Med.*, Apr. 9, 1904.

is not inclined to the view that hemorrhoids are due to accumulated fecal masses, since in many of the cases there is no history of even sluggishness of the bowels. The occurrence of hemorrhoids in children is a very important fact in this connection. He is strongly of the opinion that hemorrhoids are essentially newgrowths."

C. A. Powers¹ (Denver) reports a case of **combined abdominal and peritoneal excision of the rectum**. The patient was a woman 45 years of age. The abdomen was opened first by a gridiron incision at the outer border of the left rectus. Through this opening a finger was introduced and the location of the tumor verified. The abdomen was then opened in the median line, the bowel divided between sutures, and the ends inverted by a purse-string suture and the lower bowel then freed down to the posterior culdesac. A pair of forceps was then introduced into the vagina and passed through an opening in the posterior vaginal wall. This was made to grasp the distal portion of the bowel and draw it into the vagina. The proximal portion of the bowel was then drawn up into the gridiron incision. The peritoneum was resutured with some difficulty, owing to tension, thus completely shutting off the area of the operation. The posterior vaginal wall was then split and the entire rectum removed. The patient made a satisfactory recovery and had fairly good control over her movements, as is shown by the fact that she continues her work as a cook in a private house.

Louisa B. Aldrich-Blake² describes a **new method of performing abdominoperineal excision of the rectum**, and describes a case in which she performed this operation. It consists in opening the abdomen above the pubes, making a U-shaped incision in the peritoneum with the rounded end in the Douglas pouch and the sides about $\frac{1}{4}$ inch outside the line of attachment of the bowel, and in reflecting this flap so as to expose the bowel above the point of disease. The bowel is then thoroughly freed until it can be displaced downward to the anus or to a point well below the disease. The glands in the mesosigmoid are removed and the peritoneal flap is replaced and sutured. The abdominal wound is then closed and the growth is removed by the usual perineal incision carried back to the coccyx. The bowel containing the growth is then withdrawn and an anastomosis effected. The main point in this operation is the freeing of the bowel without opening it through the peritoneal cavity, and in shutting off this cavity thoroughly before making the anastomosis.

APPENDICITIS.

John B. Murphy³ presents a complete discussion of **appendicitis**, based on 2000 operations which he has performed since 1889. The first portion of the paper deals with the anatomy of the appendix and the second relates to the etiology of the disease. In his own cases foreign bodies, such as fruit-seeds, gallstones, capsules, etc., were present in a

¹ Boston M. and S. Jour., Jan. 21, 1904.

² Brit. Med. Jour., Dec. 19, 1903.

³ Am. Jour. Med. Sci., Aug., 1904.

little less than 2 % and fecal concretions were found in 38 %. Indiscretions in diet appeared to have little if any effect as an etiologic factor. The disease seems to have family predilections.

The symptoms are pain, sudden and severe, followed by nausea and vomiting usually within 3 to 4 hours after the onset of pain, general abdominal sensitiveness, most marked on the right side or more particularly over the appendix, and elevation of temperature beginning from 2 to 24 hours after the onset of pain. The symptoms occur almost without exception in the order given, and when this order varies, Murphy questions the diagnosis. If nausea and vomiting or elevation of temperature precede the pain, he feels certain that the cause of the trouble is not appendicitis. If the elevated temperature alone precedes the pain for a day or even two or three days, typhoid fever with ulceration of the appendix is thought of. Pain is a constant and uniform symptom and was not absent as an initial symptom in this series of 2000 cases. It usually reached its acme of intensity about 4 hours after its onset. Its subsidence was gradual in most of the cases, but when it subsided suddenly within the first 36 hours, the subsidence was due to liberation of the infected material through the neck of the appendix, rupture of the appendiceal wall, or complete gangrene of the appendix. Cessation of pain does not mean a diminution of danger, as it is so frequently and erroneously interpreted. Secondary pain after the first 36 hours is usually not colicky in character, but of a typical inflammatory type and due to periappendiceal involvement. Severe pain after the primary subsidence is always a symptom of grave danger. The primary nausea and vomiting are due to overdistention of the appendix from the accumulated products of the infection; it is distinctly reflex. The primary nausea usually passes away with one or two efforts at emesis; secondary nausea and persistent vomiting are due to periappendiceal involvement. The abdominal sensitiveness is at first diffuse, but when the appendix becomes fully distended and tense, there develop marked abdominal rigidity and localized tenderness. As soon as the acute tension subsides, the general sensitiveness disappears and it becomes circumscribed to the region of the appendix. Any attempt to palpate the appendix after the first 24 hours should be carried out with the greatest care and caution. A significant statement, and one upon which Murphy lays great stress, is the fact that elevated temperature was not absent in a single acute infective case in its early stages—that is, in the first 36 hours after the onset of the symptoms. In the acute severe infections it was present in a few hours. In acute obstructions of the neck of the appendix with mild infection it appeared later. In the calculous obstructions it did not appear until about the twentieth to the twenty-fourth hour after the beginning of pain. It is always present in the early stage of acute appendicitis. Murphy states that he would not operate on a case where he was confident that no elevation of temperature had been present in the first 36 hours of the disease. The temperature may entirely subside in the first 24 hours after the onset. If there is sudden subsidence, he is fearful that there may be a gangrene of the mucosa which prevents further absorption and therefore causes

a drop in temperature. A gradual subsidence indicates a cessation of pressure, either because of rupture into the mesoappendix or the formation of circumscribing adhesions about the appendix. "The temperature here, as in other places, must be recognized not as a manifestation of pus, but as a manifestation of absorption of the products of infection; without the absorption there is no elevation." The temperature after the initial rise may drop to below 99° F. and may remain there, and yet a large quantity of pus be present. "Secondary elevation of temperature should always be noted with apprehension, as it indicates a fresh invasion of tissue, a thrombophlebitis, a peritonitis, or cellular infiltration. These elevations are indications for immediate operation, and that usually means immediate drainage. Under these circumstances no extensive laceration of tissue or separation of adhesions should be attempted for the purpose of making a complete operation. The focus of pus should be drained and, as a rule, nothing more done." Murphy states that the more extended his experience with leukocytosis as a symptom has become, the less valuable it seems to be. He says, however, that a sudden and great increase in the number of leukocytes, supported by the other symptoms, is usually indicative of extensive peritonitis. The character of the pulse has little value in the differential diagnosis of appendicitis, although it is a fair index to the degree of intoxication and a guide to the prognosis. Reference is made to 2 cases of perforative appendicitis, in both of which the perforation occurred a number of hours before the surgeon was sent for and both patients were found walking around, with normal pulse and normal temperature. Attention is called to localized contractions of the abdominal muscles during the early hours of appendicitis, which give the sensation of a mass. Such contractions disappear under anesthesia. "In the early stages of the disease the absence of peristalsis in the appendiceal region is of value in indicating the nature of the process. A careful examination with the stethoscope reveals a 'still' area for many inches around the appendix." In describing the clinical course of acute appendicitis it is stated that occasionally pressure ulceration and perforation take place at the seat of a concretion without an acute infection. In these cases the first announcement is made by the initial symptoms of perforation. These cases are most dangerous and represent about 1% of all the acute cases. "In the streptococcus infections the mesoappendix and neighboring tissues are more seriously involved and the area of gangrene is less than with the colon bacillus or the staphylococcus types. The pain is most severe in the first 6 to 14 hours; it becomes less as the necrosis advances; the temperature is highest from the sixteenth to the thirtieth hour preceding the completion of the gangrenous process. If the gangrene continues to advance, the temperature remains high; if it becomes stationary, the temperature declines." After the establishment of a circumscribed abscess the temperature, pulse-rate, and pain subside to a considerable degree and may become perfectly normal. If the appendix ruptures into the postperitoneal cellular tissue, there is rapid rise of temperature from the absorption. With rupture into the free peritoneal cavity there are first a primary drop and then a rise of

temperature. The exudate which takes place from the peritoneum in staphylococcic infections lessens the immediate absorption and protects the patient against an overdose of the septic products. When this exudate loosens or is torn off, rapid absorption and sudden collapse with frequent bowel movements, anxious expression, followed by death, are apt to occur. If the primary infection of the appendix is of the streptococcus type and it ruptures into the peritoneum, there are rapid blistering of the peritoneum and, within a few hours, symptoms of intense intoxication, high pulse, anxious expression, talkative delirium, quick perceptions, tympany, and all the manifestations of severe and acute streptococcus-intoxication. The colon bacillus at times produces but slight irritation and moderate elevation of temperature, with even considerable seropurulent exudate. The progress of the inflammation in this infection is slow. Occasionally, however, the colon bacillus may have a powerfully irritating effect on the peritoneum, producing rapid distention of its lining cells, which results in rapid absorption of toxins. Occasionally this bacillus will produce gangrene of the peritoneum and even of the entire intestinal wall. In staphylococcic infection of the peritoneum the quantity of pus in the cavity is usually small, but when it is large, it is of the seropurulent type.

With the streptococcus type there is little, if any, free pus, but the peritoneum has a peculiar dry, granulating, blistered appearance. The colon bacillus produces pus with an offensive odor, usually considerable in quantity and thick and creamy in character. The intestines are agglutinated together and many times separate pockets are formed. The elevation of temperature, the tympany, and the collapse are commonly slower in appearing with the colon bacillus than with either of the other types of infection. Collapse is not a sign of perforation, but a manifestation of the absorption of products of infection by an abraded or blistered peritoneum. It will appear rapidly or slowly after perforation, depending on the virulence of the infection and the rapidity with which the endothelium of the peritoneum is destroyed.

For years it was thought that collapse was the immediate manifestation of perforation. It must now, however, be recognized as the symptom of septic intoxication and always a late symptom as far as the clinical course is concerned.

Murphy pays considerable attention to the question of the time of operation. The most desirable time is within the first 48 hours of the attack—that is, before perforation or infection of the periappendiceal tissue.

The diagnosis can and should be made with accuracy in the great majority of cases before the end of the first 24 hours, and almost universally within the first 48 hours. From the symptoms and clinical course of the disease in the first 48 hours it is impossible to predict, with any degree of certainty, what the subsequent course of the case will be—that is, whether the tendency will be to subsidence and cure by natural processes or to a virulent, if not fatal, termination. Operation in the

early stage of the condition must, therefore, be considered the period of election. Operation during the increasing or spreading inflammatory process, which may be anywhere between the second and fifth days, is recommended, but Murphy states that it should be a limited one and consist simply in incision and drainage with the removal of the appendix if it is accessible and easily amputated. At such an operation there should be the least possible separation of agglutinations or other trauma to the infected tissues. This is one of the points on which Murphy lays greatest stress. When the patient is apparently overwhelmed by the intoxication from a circumscribed or diffuse peritonitis, Murphy is satisfied with simply making an incision in the abdomen and relieving the pus-tension by the insertion of a large drainage-tube without irrigation and without sponging or manipulation of the tissues. On the other hand, in the ascending stage of the disease, where the depression is not noticeable, when the intoxication is not severe, even when the quantity of pus is large, circumscribed or not circumscribed, the appendix is removed. In other words, the extent of operation is governed by the constitutional symptoms of the sepsis rather than by the extent or character of the pathologic changes. Exudations must not be rubbed or torn off, as they carry with them the endothelia and leave an abraded absorbing surface. The endothelial coat constitutes the "shingles of protection." Murphy states that in 9 out of 10 cases operated upon in this stage he has removed the appendix, and that in the last 2½ years' work in general septic peritonitis he has had but one death following the operation, and that was due to double pneumonia and occurred on the sixth day after operation, the peritonitis having entirely subsided. The treatment after operation consists in placing the patient in Fowler's position for 2 or 3 days and administering large quantities of saline solution by the rectum—from 4 to 12 quarts in 24 hours. Mild catharsis is induced by small doses of calomel, beginning 8 hours after the operation. Murphy strongly condemns irrigation, stating that water has no more license in the peritoneum than it has in the lung. The semisitting posture of Fowler is considered to be of the greatest importance if drainage is required.

Operations in the third stage or the stage of subsidence of the inflammatory process are not so urgent by any means as in the first and second stages. Here there is usually a mass, and this should be carefully separated from the general cavity by dams of gauze. The incision is made to the inner side of the mass.

Operations during the fourth or intermediate stage are strongly recommended. About two-thirds of Murphy's cases were operated upon at this period, and there was but one fatality, and that was due to peritonitis resulting from infection carried in on the hands of an assistant, who also infected 3 other clean cases the same day. Murphy favors opening the abdomen through the outer margin of the right rectus muscle. The appendix-stump is crushed with a hemostat, a ligature placed about it, and then 2 rows of inversion sutures are introduced. In the pus cases the appendix is simply ligated and cut off. Gauze

drainage alone is not considered sufficient nor even so satisfactory as a large rubber tube. In all the acute severely infected cases drainage was instituted even though the appendix had not perforated. In the after-treatment of the very ill cases the greatest confidence is placed in the semi-sitting posture, drainage, and stimulation by large quantities of salt-solution introduced into the rectum, and by strychnin. Due to the improvement in technic, greater experience, and the fact that cases are now operated upon more frequently during the interval and during the early stage of the disease, Murphy's mortality has been reduced from 11 % in the first 100 cases to 2 % in the last 100 cases.

[This is an article of the greatest practical value, and it is founded on an immense experience. Dr. Murphy holds some opinions which are less radical than we had supposed; for instance, the view that between the second and the fifth day of the disease the operation should be a limited one, consisting of incision and drainage, the appendix being removed only if it is easily accessible, and the greatest care being taken to avoid separating agglutinated intestine. We believe this is the soundest of good advice, and that many lives are sacrificed in the worship of the fetic of alleged operative completeness by those who *always* remove the appendix, irrespective of the conditions encountered. Further, Murphy says that if the patient seems to be overwhelmed by intoxication, a simple abdominal incision should be made to relieve pus-tension, there should be no manipulation or irrigation, and a large drainage-tube should be introduced.]

Under the heading of **one year's work in appendicitis** John B. Deaver¹ reports 566 cases operated upon between September 1, 1902, and September 1, 1903. The total mortality for this series was 5 %. The cases are divided into 3 classes:

1. Those cases in which the patients were suffering from general or diffused peritonitis.

2. Cases in which an abscess was present, localized, and usually filling the right iliac fossa, pelvis, or both, and in many instances extending up to the liver; the latter organ has been found ulcerated. The appendix was also perforated and necrotic, often gangrenous as well.

3. Cases in which the disease was confined to the appendix with stricture, ulceration, and sometimes necrosis of the mucous membrane. In many cases pus was found in the appendix after its removal. In some instances a small area of adhesive peritonitis was present outside of the appendix, but no pus. In many cases the appendix was densely imbedded in organized exudate.

In every fatal case a careful autopsy was made. Deaver repeats with emphasis his former statement regarding the necessity of early operation in all cases of appendicitis, and states that there is great peril in waiting for the interval. His idea is that every case should be operated upon while the disease is confined to the appendix. The following tables show the mortality in the 3 classes:

¹ Amer. Med., Oct. 17, 1903.

TABLE I.

| | | | |
|----------------------------|-----|-----------|--------|
| Peritonitis, general | 16 | 5 deaths | 31.0 % |
| Abscess cases | 183 | 22 deaths | 12.0 % |
| Appendicitis | 367 | 3 deaths | 0.8 % |
| | 566 | 30 deaths | 5.3 % |

TABLE II.

| | | | |
|-------------------------|-----|-----------|--------|
| Adults, acute | 344 | 26 deaths | 7.56 % |
| Adults, chronic | 164 | | |
| Children, acute | 49 | 4 deaths | 8.16 % |
| Children, chronic | 9 | | |
| | 566 | 30 deaths | 5.3 % |

In discussing **recent views on appendicitis** the British Medical Journal¹ editorially refers to an address by Woods Hutchinson,² which deals chiefly with the morphologic and ontogenetic history of the appendix. This authority states that—"In birds and herbivorous mammals the appendix is represented by a large, voluminous, and actively functional pouch; its appearance seems to be related to the acquisition of terrestrial habits, and to the necessity of avoiding unnecessary loss of water in the feces. As the purely herbivorous and particularly graminivorous diet becomes replaced in the animal scale by a less bulky and more highly nitrogenous and, above all, fleshy larder, the need for an appendix progressively diminishes, but it is only in man that this atrophy has, so to speak, assumed an acute form. The result has been a great liability of this organ to inflammatory diseases, while the surgeon may feel that in removing it he is only anticipating the work of nature." Hutchinson expresses hearty approval of the Ochsner method of treatment because he believes it to be based upon good reasoning.

After a close study of the **leukocyte count in 83 cases of appendicitis**, Herbert French³ (London) reaches the following conclusions: "The value of leukocytosis in relegating a given case of appendicitis to its proper group, and in deciding whether an operation should be performed or not, is apt to be overrated. Its value, judged from the present cases, is even less than that deduced by other recent observers from the figures they have found. Many cases with 20,000 leukocytes have resolved spontaneously; many with 15,000 or less have had pus present. At the same time, leukocyte-counts have afforded valuable evidence in certain cases. In no case in which the leukocytes have reached 35,000 has pus been absent. A rising count is of more importance than is the absolute number. Above all, leukocytosis is to be regarded as but one clinical sign among many. By itself it may mislead, but, taken in conjunction with the pulse-rate, the temperature, and the general condition of the patient, it is an additional sign which may be most valuable in the

¹ Sept. 26, 1903.² Amer. Med., Aug. 1, 1903.³ Practitioner, June, 1904.

diagnosis of a difficult case." [We believe that the leukocyte count has some value as a symptom, but not great value. It should never be regarded as the final test of the patient's condition—it is sometimes misleading; it should be regarded as only one of many symptoms, and the other symptoms must never be neglected.]

James Sherren¹ writes on the **occurrence and significance of cutaneous hyperalgesia in appendicitis**. Head and Mackenzie were the first to draw attention to the subject of cutaneous hyperalgesia in visceral disease, which they did independently in 1892. Müller has recently also contributed a paper on this subject. Sherren made a number of careful observations on patients admitted to the London Hospital, and reports in detail 11 of these and also presents a table showing the result of the operation in each. Two varieties of tenderness are met in appendicitis—the superficial or cutaneous hyperalgesia and the deep. Cutaneous hyperalgesia is tested by gently pinching or stroking the skin, beginning in an area not tender and working toward the suspected tender area and so outlining it. All deep pressure must be carefully avoided, only the skin being stimulated. The following are Sherren's conclusions: "1. Cutaneous hyperalgesia is probably present at some time during all first attacks of appendicitis, except perhaps in the fulminating type, and depends upon tension within the appendix. 2. It may be absent in attacks after the first, if the first attack was of sufficient severity to destroy nerve-tissue in the wall of the appendix. 3. When present in attacks subsequent to the first, it often persists long after all other signs of the disease have gone, owing to the tension within the appendix being kept up by the presence of a stricture. 4. It gradually disappears during convalescence as the other signs of the disease clear up. 5. Disappearance of cutaneous hyperalgesia without improvement in the general condition of the patient is a sign of perforation or gangrene of the appendix and should be a signal for immediate operation. 6. The presence of cutaneous hyperalgesia is no contraindication to operation. Abscesses may form and general peritonitis may develop while it is present. 7. Its absence, on the other hand, is of great importance. Absence of cutaneous hyperalgesia, the patient coming under observation early in the first attack of appendicitis, is a sign of gangrene of the appendix unless the case is obviously a mild one and the patient is rapidly getting well. 8. Cutaneous hyperalgesia is, as a rule, absent in cases of abscess of the appendix. 9. The age of the patient and the position of the appendix have no influence upon the cutaneous hyperalgesia. 10. It is occasionally of use as an aid to the diagnosis of appendicitis."

C. W. Maunsell-Moullin,² in a clinical lecture, describes the **significance of pain and tenderness in appendicitis**. In acute inflammation of the appendix the absence of pain is no indication that the most serious mischief is not going on. The initial pain in acute cases is due to the peristaltic action of the cecum or the appendix dragging upon the attachment of the peritoneum to the abdominal wall. This is especially likely to occur when the appendix is fixed by adhesions or the mesentery

¹ Lancet, Sept. 19, 1903.

² Lancet, Sept. 19, 1903.

is short or twisted upon itself. The cessation of this umbilical pain without improvement in the other symptoms is due to the arrest of peristalsis caused by the extension of inflammation to the muscular coat of the bowel. The development of localized pain over the appendix indicates a spread of the inflammation to the parietal peritoneum or to the postperitoneal cellular tissue. In the beginning stress is laid upon the insensitiveness of visceral peritoneum and the sensitiveness of parietal peritoneum. Absence of local pain means nothing, while severe pain is always of serious importance. Tenderness on pressure in cases of inflammation of the appendix may be either deep or superficial, or may be both deep and superficial. The bowel itself, whether inflamed or not, is not tender on pressure except where it is in contact with the postparietal cellular tissue, so that pressure can be transmitted to this. The presence, therefore, of deep tenderness indicates the extension of the inflammation to this cellular tissue or to the parietal peritoneum. Deep local tenderness at the beginning of an attack may indicate the part of the parietal peritoneum which is first involved. Superficial tenderness consists in a very marked cutaneous hyperesthesia. The area of hyperesthesia varies with the situation of the appendix. It is evidence that the corresponding spinal center is receiving from some part of the body to which its nerves are distributed stimuli of unwonted intensity, and that it is, in consequence, unduly sensitive to ordinary impressions. This hyperesthesia may be due to a variety of conditions, but when associated definitely with other evidence pointing to inflammation of the appendix, it may be taken that the whole of the appendix itself is involved, and that, therefore, though the inflammation may subside, it will in all probability leave some permanent alteration in the appendix which will necessitate operation later. Sudden cessation of this hyperesthesia without at the same time improvement in the general symptoms indicates very strongly that the appendix has become gangrenous and that immediate operation is necessary.

Guinard¹ describes a number of cases in which an **error in diagnosis** was made and in which the real trouble lay in the **appendix**. In each case there was chronic appendicitis of a mild type without crises and presenting but one symptom, namely, pain. Numerous cases are referred to in which the patient was treated for a variety of ills, but they were not relieved until the appendix was removed. A not infrequent error is that of attributing to uterine fibroids pain which in reality has its origin in the appendix. Uterine fibroids are painless unless they are complicated by inflammation of the tubes. Guinard is a strong advocate of examining the appendix whenever the abdomen is opened for other lesions, and of removing it unless it is certainly normal.

C. Van Zwalenburg² has conducted a number of experiments upon dogs, which go to prove that **obstruction and consequent distention of the appendix are the common causes of inflammation of this organ**. After reporting in detail his experiments, Van Zwalenburg reaches the following conclusions: "1. Simple infection does not account

¹ La Sem. méd., Jan. 27, 1904.

² Jour. Am. Med. Assoc., Mar. 26, 1904.

for the suddenness of the attack nor early severity of the pathologic changes in acute appendicitis. 2. The evident interference with the blood-supply is best accounted for by an increased intraappendicular pressure. 3. Simply injecting bacteria into the appendix will not produce appendicitis unless used in abnormal amounts and virulence. 4. Subperitoneal ligation of the appendix with a simple ligature without distention cannot be made sufficiently permanent to produce a general infection of the appendix typical of appendicitis in the human being. 5. Experiments on dogs show that hydraulic pressure equal to the arterial tension maintained within the lumen of the appendix for a short time is promptly followed by typical appendicitis. 6. The blood-supply in an extremity may be cut off with impunity for hours; but in the appendix the ever-present bacteria at once begin an infection, their entrance into the tissues being facilitated by the opening of normal and traumatic avenues by the very distention which cuts off the circulation. 7. The importance of making a complete diagnosis and prognosis during the first 12 hours of the attack is emphasized. 8. This study suggests the possibility of infections or other lesions being produced in other hollow viscera, especially in the gallbladder, the stomach, and intestines by temporary overdistention."

Intestinal parasites as a factor in appendicitis is dealt with by J. C. Hubbard¹ (Boston), who reports 2 cases in which the appendix was perforated by worms. The first patient was a child 9 years of age who was suffering from general peritonitis. When the abdomen was opened, creamy pus was found everywhere. The appendix was red, swollen, gangrenous, and perforated. It contained 2 small pinworms. The patient died the day after operation. The second case was that of a boy 16 years of age who was also extremely ill with general peritonitis on his admission to the hospital. He too died shortly after operation, which consisted simply in free incision and drainage. At the autopsy a dead lumbricoid worm was found free in the peritoneal cavity and another was found halfway through a perforation in the appendix. Hubbard reaches the following conclusions: "An intestinal parasite causes appendicitis through its presence as a foreign body; and by its struggles may bring about a perforation and peritonitis where otherwise none would have occurred. *Trichocephalus dispar* has been proved to cause an inflammation of the appendix by injuring the mucous membrane while sucking the blood of the host. *Ascaris lumbricoides* has been found with a material similar to that in trichocephalus in its intestinal epithelium, and therefore is supposed to attach itself to the mucosa of the host and thus start the processes which result in appendicitis. *Oxyuris vermicularis*: no proof has been found that it causes an appendicitis except in its role of foreign body."

Bloodgood² (Baltimore) reports a rare case of **appendicular abscess** situated between the layers of the mesentery of the small intestine, apparently due to a perforation between the base of the appendix and the cecum by a roundworm. This case is reported in detail and is

¹ Boston M. and S. Jour., Dec. 3, 1903.

² Am. Jour. Med. Sci., Oct., 1903.

an interesting one. The patient was a child 8 years of age. The first operation consisted in the drainage of an appendiceal abscess. After the patient was anesthetized a mass could be palpated in the middle zone of the abdomen, slightly movable from right to left, but not from above down. The abdomen was opened in the midline from just above the umbilicus down to the pubes. A mass was encountered extending from the cecum to the third lumbar vertebra between the folds of the mesentery. The attachment of the appendix was obscured by lymph. There was no effusion into the cavity. On separating the adhesions near the base of the appendix pus escaped and a large cavity was found extending toward the vertebral column between the folds of the mesentery. Extensive gauze drainage was employed and the patient was the next day removed by rail to Baltimore, as Bloodgood anticipated a possible obstruction of the bowels from the large amount of gauze inserted. The next day there was symmetric distention of the abdomen occupying the umbilical and epigastric areas. From the clinical picture at this time Bloodgood was not certain that there was definite obstruction; he felt, however, that obstruction was beginning and determined to relieve it early. A second operation was performed 27 hours after the first. Protecting the abscess cavity by additional packing, the first packing was removed; with it came 2 or 3 roundworms. Fresh packing was introduced and a loop of distended small intestine was selected and opened. A large accumulation of gas and fluid in the upper loop and the nondistended condition of the small intestine near the cecum indicated clearly a beginning obstruction. The open loop of small intestine was then surrounded by gauze and allowed to drain. The patient recovered satisfactorily from this operation, but the opening had been so high up in the small intestine that starvation set in. Several roundworms perforated the wall of the intestine about a rubber tube which had been inserted into it. The leakage produced extensive eczema of the skin. Numerous methods of feeding the patient were employed, without success. Several unsuccessful attempts were also made to close the fecal fistula. This was finally accomplished by intestinal anastomosis.

W. B. McIntosh¹ (Portland, Maine) reports a case of **appendicular abscess due to perforation of the appendix by a fishbone**. The bone was 1½ inches long and about the thickness of an ordinary silver probe.

Erdmann² (New York) deals with **appendicitis in children**. During the past 2 years he has treated 29 cases of appendicitis in children under 10 years of age, operating in 22 of them, with 2 deaths. There were 14 cases of gangrene and perforation; 7 cases with foreign bodies, 4 cases included under foreign bodies containing from 6 to 30 pinworms each. The appendix was removed in every instance. Fourteen cases were drained; these were not in each instance the 14 cases of perforation and gangrene, as some of the latter were closed. Of the 7 patients not operated upon, 2 died within a few hours after they were seen, operation not being considered advisable, owing to the almost moribund condition.

¹ N. Y. Med. Jour., June 18, 1904.

² N. Y. Med. Jour., Mar. 19, 1904.

One was removed to another hospital for operation, and in the 4 remaining cases permission for operation was refused. The following are the ages of the children operated upon: 1 at 3½ years, 2 at 5 years, 3 at 6, 7 at 7, 4 at 9, and 5 at 10 years. During the period mentioned Erdmann has also removed the appendix 9 times in infants from 4 months to 8 months of age, and once in a child of 4 years and 3 months. These were all intussusception cases. In discussing the diagnosis of appendicitis in children Erdmann refers to the difficulty encountered often in differentiating beginning pneumonia from inflammation of the appendix. He also describes a case of pneumococcic peritonitis occurring in a child, the appendix being perfectly normal. A sign which is considered of very great value in diagnosing appendicitis is that the child unconsciously places his hand in the region of the appendix to ward off manipulations in this area. After operation Erdmann permits the patient to get out of bed on the seventh day if drainage has not been employed. If a drain was used, the child was allowed to sit up in bed on the third or the fourth day.

An editorial in the *British Medical Journal*¹ discusses two communications on the subject of appendicitis. One is by Boije, of Helsingfors, on **appendicitis in pregnancy and childbed**, and the other by Albert Martin, who reports an undoubted case of **appendicitis due to the presence of segments of tenia in the appendix**. Boije divides his subject into 3 classes: "(1) Cases in which the existence of appendicitis was proved by operation or necropsy; (2) cases in which it was diagnosed on clinical evidence alone; and (3) a series in which acute appendicitis set in during the puerperium. The first 2 classes are important to distinguish, for diagnosis of inflammation of the vermiform appendix in pregnancy is often very difficult, and, where symptoms are mild, often impossible. There is no evidence that pregnancy is a predisposing cause of this complication, and pains in the right iliac fossa, especially in early pregnancy, are very often caused by inflammation or congestion of the right appendages. Dr. Boije gives full clinical histories of cases under the care of Professor Engström, including many in which pregnancy occurred in patients after removal of the appendix. Pregnancy, according to these observations, did not prejudice appendicitis unfavorably; in many of the proved cases the local pains were mild. On the other hand, the complication in question gravely affects the pregnancy, abortion and premature birth being relatively frequent, though by no means invariable. An operation was performed in 31 cases, and in no less than 14 death ensued. Abortion occurred after operation in 18 instances; these cases were mostly severe. The conclusion is that inflammation of the appendix should be treated during pregnancy on the same principles as in men and in nongravid women."

The patient of Martin was a woman 23 years of age who had had several typical attacks of appendicitis. "The appendix was not adherent; as it was being divided in the usual way, two segments of tenia fell on to the dressings; they were clearly living. A small cyst of the left ovary was

¹ Nov. 21, 1903.

removed. Recovery was speedy. The presence of the tenia had caused inflammatory thickening of the walls of the appendix. A few days after the operation a large dose of peletierin tannate was given and a long tapeworm was expelled; it was a *Tenia saginata*, better known by the now discarded name, *Tenia mediocanellata*. This seems to be the first time that a tenia has been discovered in the diseased appendix."

Holmes¹ (Philadelphia), under the head of **left-sided appendicitis**, describes 2 autopsies in which the appendix was found on the left side of the body. There was no inflammation, however, in these cases. They are reported simply to show the anomalous position of the appendix and to suggest the possible difficulty of diagnosis had inflammation occurred. In each case the mesenteric attachment extended from right to left instead of from left to right. In the first case the ileocecal valve was on the left side of the fourth lumbar vertebra. The appendix pointed upward and backward toward the liver, and was attached just below the ileocecal valve. The ascending colon extended from the left side of the fourth lumbar vertebra obliquely upward to the right, passing over the aorta to the right side of the body of the third lumbar vertebra, where it turned upon itself and went again over to the left side as far as the crest of the ilium, where it made a sharp turn upon itself, running upward to the under surface of the spleen to form the splenic flexure; thence it was continued down in the usual position of the descending colon. In the second instance the ileocecal valve was situated in the median line over the promontory of the sacrum. The cecum was somewhat pyriform in shape, of which the apex extended to the appendix attachment. From the cecum (upon the promontory of the sacrum) the colon ran downward into the pelvis as far as the third sacral vertebra; it then turned upward to the right iliac, ascended in front of the kidney to the under surface of the liver, thence passed transversely across the abdominal cavity to the left side, below the stomach, then turned upon itself and went back to the median line, and again reverted upward and backward to the spleen; thence coursed abruptly downward, to form the descending colon, which again went toward the median line, and thus, with the omega loop, formed a double S. The appendix was a little to the left of the median line, entering the cecum as it rested on the promontory of the sacrum, the base being on a line between the anterior-superior spinous processes of the ilium, the body running upward in front of the sigmoid mesocolon, then turning downward in front of the omega loop in front of the brim of the pelvis. The other abdominal and thoracic viscera in both instances were perfectly normal.

W. Fred Jackson² records a case which he believes to be one of **prenatal appendicitis**. The child died, at the age of 40 hours, from mercurial poisoning due to the swallowing of a mercuric chlorid tablet. The child was perfectly healthy at 12.30 p. m. and died at 5.30 p. m. It is not known at what hour during this interval the mercury was swallowed. A postmortem examination was made and the interesting condition in the appendix found. The organ was much elongated and congested,

¹ N. Y. Med. Jour., Oct. 17, 1903.

² Am. Jour. Med. Sci., Apr., 1904.

and was bound to the cecum by numerous and firm adhesions. It was reduplicated upon itself and the turns firmly bound together. There was nothing in the history of the birth to account for this condition.

C. F. Burnam¹ reports from the service of Professor Kelly at the Johns Hopkins Hospital 1 case of **primary actinomycosis of the appendix**, 1 case of **primary carcinoma of the appendix**, and 2 cases of **tuberculosis of the appendix**. The case of actinomycosis was that of a woman 28 years of age. This patient was first operated upon for a large abscess in the abdominal wall. In the material from this cavity actinomyces were found. Before healing took place, however, it was necessary to drain the cavity more thoroughly. At this time it was found that the destruction of tissue had extended down to the peritoneum. Healing took place, the patient being given large doses of iodid. Improvement continued for about a month, when the patient developed signs of involvement of the right lung and liver and died about a month later. At the autopsy multiple abscesses of the liver, yellowish, opaque areas in the lungs, an area of softening and necrosis in the spleen, all containing actinomyces, were found. The appendix was found bound down firmly behind the cecum. About it and in it were small abscesses also containing actinomyces. In considering the clinical course in this case in conjunction with the pathologic findings it is believed that the primary point of disease was in the appendix, and that the next point of involvement was the abdominal wall, and the last, the other organs mentioned.

The case of primary carcinoma of the appendix was that of a man 25 years of age. For 2 years he had had recurrent attacks of pain in the appendix region. The appendix was removed at the subsidence of an attack and was found slightly adherent, quite red, and inflamed. There was no enlargement of the mesenteric glands. The patient made a rapid recovery. Microscopic examination showed carcinomatous infiltration of the mucous membrane and submucosa at the tip. It is impossible to say whether the attacks of appendicitis were due to the growth or whether the growth was the result of inflammation of the appendix.

Of the 2 cases of tuberculosis of the appendix reported, one was primary in the appendix and apparently limited to this organ. In the second case there was more or less general tuberculosis and the disease of the appendix was thought to be secondary.

Normal involution of the appendix is briefly discussed by Robert T. Morris² (New York). Senn and Ribbert were the first to describe the involution changes which normally take place in the appendix, but these authors did not refer to the symptoms which accompany this change. "Pathologically the change consists at first in a replacement of the lymphoid and mucous layers of the appendix with connective tissue, and this eventually includes the muscularis and all tissues excepting the peritoneum in many cases. Nerve-filaments seem to persist in the connective tissue for a longer time than any of the other normal structures, and microscopic section of an involution appendix will often show such an aggregation of new cells about the nerve-filaments that the evidence of

¹ Johns Hopkins Hosp. Bull., Apr., 1904.

² Brooklyn Med. Jour., Feb., 1904.

irritation is well marked. The symptoms that go with normal involution of the appendix are dependent upon the fact that the persisting nerve-filaments are irritated in the contracting connective tissue, very much as are the nerve-filaments in the contracting scar of the stump of an amputated arm." The irritation of these sensory nerve-filaments gives rise to discomfort and pain in the appendix region, although tenderness is not often marked. Patients suffering in this way are likely to be treated for many different conditions and pass from the hands of one physician to another. There is often no history of acute attacks of appendicitis or of an infective process. When the appendix of such a patient is removed, it shows that the inner layers of the appendix have been replaced by connective tissue. It is thought that patients suffering from normal involution of the appendix are less apt to have true infective appendicitis than others. Morris's attitude toward operation in these cases is to explain the matter to the patient and leave the decision to him.

Dealing with the **technic of appendicectomy**, Zeller¹ calls attention to the possible danger of leaving a stump of mucous membrane covered by the serous coat; in other words, the "cuff" method of amputating the appendix. The mucous membrane, which is apt to be septic, may cause suppuration in the wall of the cecum, with disastrous results. This is, of course, of rare occurrence, but Zeller refers to a case in which death was due to the rupture of a small abscess on the fifth day after a perfectly clean appendix operation. With this danger in view he practises complete extirpation instead of amputation of the appendix, taking out with the organ a small portion of cecal wall. The opening into the cecum is then closed by sutures. With an ordinary amount of care there is no risk of discharge of cecal matter. [This method of removing the appendix has been employed by many American surgeons for a number of years.]

Riedel,² after discussing the **objections to the various methods now in vogue of treating the stump in appendicectomy**, describes a method which has been practised in his clinic at Jena. This consists in dividing the appendix between two catgut ligatures, the first of which is placed at the cecum. After removing the appendix the mucous membrane of the remaining stump is removed and the muscular and serous coats approximated by sutures and then buried by another row of sutures.

The **advisability of establishing rectal drainage in cases of pelvic abscess due to appendicitis** is heartily recommended by Bérard and Patel.³ Including their own cases, they have made a collection of 44 cases of rectal incision and drainage in pelvic appendicular abscesses, all of which were successful. A transverse incision is made with curved scissors, guided by the forefinger. After making a free opening, a drainage-tube is inserted, but may be dispensed with after 3 or 4 days. If the temperature should rise and other symptoms develop showing interference with drainage, the tube should be reintroduced. [One of us (Da Costa) thus operated upon a case.]

¹ *Zent. f. Chir.*, 1903, No. 45.

² *Zent. f. Chir.*, 1903, No. 51.

³ *Rev. de Gyn. et de Chir. Abd.*, Sept. and Oct., 1903.

A. W. Morton¹ (San Francisco), under the title of **conservative treatment of acute appendicitis**, strongly urges the adoption of the Ochsner method of treatment. In all cases where it is believed that the pus is confined to the appendix immediate operation is performed, but whenever inflammation and pus have extended beyond the organ, the Ochsner treatment is rigidly followed until the trouble becomes localized, when the case is operated upon.

The **mortality of appendicitis** is freely discussed by Dennis,² who presents what he considers the best rules for treatment in these cases, and also reports briefly his results in 119 recent consecutive cases. All surgeons are agreed that in acute appendicitis the necessity for immediate operation is urgent. Regarding the treatment of acute catarrhal cases Dennis believes that any case after 36 hours that is not improving in every way should be operated upon, and quotes Fowler's statistics to show that the mortality in these cases increases with the duration of the disease. When simple catarrhal cases are doing well after 36 hours, they should be allowed to recover and should be operated upon in the interval. This rule regarding operation, however, does not apply to the inexperienced operator or to operation under improper surroundings. Under these circumstances the treatment of Ochsner, consisting in the application of ice, gastric lavage, starvation by the mouth, and feeding by the rectum, should be followed. In Dennis's 119 consecutive cases there were 2 deaths. The first was a tramp, and death was due to alcoholism and empyema; the second resulted from an abscess of the lung secondary to a subphrenic abscess caused by a suppurative appendicitis. In both cases the condition was desperate at the time of operation. The interval cases of this series all recovered without complication, as did also the mild simple catarrhal cases. There were 28 cases of acute gangrenous appendicitis with perforation and abscess, and in this class the 2 deaths occurred. There were 11 cases with perforation and pus free in the peritoneal cavity; among these there was no death. These 11 cases of diffuse peritonitis are reported in detail. Dennis's treatment of them in brief is as follows: A free incision and thorough cleansing of the appendix region with mercuric chlorid solution, followed by hydrogen dioxid solution, which in turn is followed by salt-solution. The general peritoneal cavity is then cleansed and extensive drainage employed. Stress is laid upon the importance in these cases of treating the parts in as gentle a manner as possible. The appendix was removed when it was easily accessible.

I. S. Stone³ (Washington) presents a paper on **retroperitoneal infection a result of appendicitis**, first referring very extensively to the literature on this subject, especially to the recorded cases. These all go to show that a large number of cases of appendicitis die directly from retroperitoneal infection. Infection may reach the retroperitoneal space by passing directly through the peritoneum to the cellular tissue behind from an intraperitoneal abscess, or it may reach the cellular tissue from a

¹ Amer. Med., June 4, 1904.

² Med. News, Jan. 9, 1904.

³ Amer. Med., Feb. 27, 1904.

ruptured retrocecal appendix, or from a rupture into the mesoappendix. Infection by way of the blood- or lymph-channels is also possible. It is shown that in quite a number of cases the appendix is partially retroperitoneal, being behind the cecum or in contact with its muscular wall. When such appendixes become inflamed, retroperitoneal infection is very apt to occur. The symptoms of retroperitoneal infection are mainly those of septicemia in addition to those of appendicitis. It is possible that perforation, retroperitoneal infection, and suppuration can and do occur without peritonitis. In such cases the symptoms due to infection of the lymphatic vessels or connective tissue occur with immediate systemic manifestations. Persistent high temperature and quick pulse after appendicectomy should always lead one to suspect possible complications. Stone reports numerous cases of his own to illustrate the condition under discussion. In conclusion the following statements are made: "1. It may proceed directly through the peritoneum to the cellular tissue behind, from an intraperitoneal abscess (necrosis). 2. It may reach the cellular tissue from a rupture (perforation) in a congenitally displaced appendix (retrocecal), or rupture into the mesoappendix, and this may be accomplished without intraperitoneal infection. 3. Infection by way of blood- or lymph-channels."

Michel and Gross¹ report an interesting case of **appendiculovesical fistula**. The patient was a woman 20 years of age who was delivered of a dead infant on December 23. The patient was apparently well at the end of a month. On February 1 she was taken ill with severe pain in the right iliac fossa and was compelled to go to bed. Some days later pus was observed in the urine. She was admitted to the hospital on March 24. At this time a mass could be felt in the right iliac fossa, and by bimanual examination a mass was detected in the right side of the pelvis. As no improvement followed treatment, the patient was operated upon on April 24. It was thought that there had been an abscess in the right appendages which had opened into the bladder. When the abdomen was opened, the appendix was found elongated, passing along the lower portion of the uterus and firmly adherent to the bladder. It was adherent nowhere else, and the right as well as the left appendages were normal. The anterior surface of the uterus, however, was firmly adherent to the bladder. The right broad ligament was considerably thickened. A ligature was put about the adherent end of the appendix and the organ removed. The patient made a prompt and complete recovery. Two questions arise, whether a periappendicular abscess opened into the bladder, or whether a primary adhesion of the appendix to the bladder produced infection of the bladder-wall with consequent ulceration and fistula. The latter is the view taken by the authors.

Bunts² (Cleveland) presents a very complete study of **parotitis complicating appendicitis** and reports 3 cases. The first patient had a mass in the right iliac region but declined operation. The Ochsner treatment was employed, and about the seventh day, when the general symptoms were improving, there developed parotitis of the right side.

¹ Arch. gén. de Méd., Aug. 25, 1903.

² Am. Jour. Med. Sci., May, 1904.

Suppuration occurred, and the area was drained. A few days later the left gland became inflamed, suppurated, and was drained. The mass in the appendix region entirely disappeared and the patient recovered and was perfectly well one year later. The second case was that of a man 29 years of age who was suffering from his fifth attack of appendicitis within a year. There was a mass in the appendix region with apparent obstruction of the bowels. The abdomen was opened, the abscess cavity drained, and a gangrenous appendix removed. About a week later the patient developed a right parotitis; suppuration took place and the gland was drained. Two or three days later the left gland became very much inflamed, but suppuration did not take place. Bacteriologic examination showed a pure culture of the colon bacillus from the appendiceal abscess and *Staphylococcus pyogenes aureus* from the parotid abscess. The patient recovered. The third case was that of a woman 62 years of age. In this case there was a large mass in the right iliac region. No operation was performed, but the Ochsner treatment was followed. The symptoms abated and the temperature reached normal in a few days and remained so until the twelfth day after admission, when there was a slight rise and there developed parotitis of the left side. Suppuration occurred and drainage was instituted. Eight days later the gland on the right side became inflamed. Suppuration, however, did not take place. In a day or two following this the patient complained of pain and discomfort in the right iliac region again. The mass, which had disappeared, had not reappeared, and the patient's temperature resumed the normal and remained there until her death, which occurred about 3 weeks after the development of parotitis. Both parotids had entirely recovered before death took place. It was thought that death was due to a low form of sepsis. Bunts discusses the various theories which have been put forth to account for the occurrence of parotitis. There are 3 theories regarding postoperative parotitis: 1. A sympathetic or nervous connection between certain viscera, notably the ovary and the parotid gland. 2. Metastasis. 3. Direct infection of the gland by way of Stenson's duct. The first of these is thought to be extremely improbable. "That metastasis may and sometimes does occur in the parotid gland cannot be denied, especially in pyemic or septicemic cases, but it seems hardly probable that the parotid alone should be involved, while all the other organs of the body and more frequent sites of metastatic deposits should escape. So that while in single instances this metastasis may be assumed to have occurred, we cannot insist upon this being the universal or even common cause." Direct infection through Stenson's duct is thought to be the most frequent source of infection, and the bacteriologic investigations of Hanau in several fatal cases bears out the view that an ascending infection from the mouth is the primary and direct cause of this infection. Injury to the gland or duct which may occur during the administration of the anesthetic is suggested as a possible contributory cause. "So far as may be judged from the few reported cases of parotitis following appendicitis, this complication is not to be considered a serious one or one likely to lead to any grave results, obviously very

different from those rare cases of pyemia with coincident involvement of the parotid."

N. P. Dandridge¹ reports an interesting case of **gangrene of the colon and ileum after an operation for appendicitis** in which, on removing a mass of mesenteric glands, a branch of the ileocecal artery was tied. The patient was a man 26 years of age who had had a number of attacks of appendicitis, and at the time of operation had a mass in the right iliac region. When the abdomen was opened a mass, supposed to be the appendix, with extensive exudation above it, was enucleated. During this part of the operation a vessel of some size passing through the mass was tied. The parts removed proved to be some enlarged glands about the size of a hen's egg. At the time they were presumed to be tuberculous, but proved later not to be so. The appendix was situated behind the cecum and was subsequently removed. The wound was closed without drainage as no pus was encountered. On the seventh day it had entirely healed and the stitches were removed. During this period there had been considerable nausea, but it diminished and the patient's bowels were again moving naturally. On the eighth day he complained of pain, and the dressings were found saturated with a thin fecal discharge. This rapidly increased in amount and the wound became infected. Subsequently about 15 inches of small intestine and cecum sloughed away, producing a complete artificial anus at the site of the wound. Forty-nine days after the first operation an attempt was made to establish a lateral anastomosis between the ileum and the transverse colon; this, however, proved unsuccessful and discharges continued to take place through the wound. The ileum and colon were separated from the wound 189 days after the first operation, and an end-to-end anastomosis was made by means of a Murphy button. This was nearly but not quite successful, as a fecal fistula existed for some time at the site of the wound, which finally closed after the application of a rubber sponge held against the fistulous opening by means of an elastic band round the wrist. Before this device was employed two unsuccessful attempts were made to close the fistula. The interesting features in this case are the remarkably good condition of the patient before the establishment of the artificial anus and the fact that there was no leakage into the general peritoneal cavity after the bowel became gangrenous.

HERNIA.

Wm. J. Mayo² describes his further experience with the **vertical overlapping operation for the radical cure of umbilical hernia**. The Mayos first practised the overlapping method in 1895. They have performed this operation 35 times, overlapping from side to side 10 times and from above downward 25 times. They now employ the latter method exclusively. There were no deaths in this series. In only one case has there been a relapse as far as Mayo has been able to discover, and in this case the overlapping was from side to side.

¹ Ann. of Surg., Sept., 1903.

² Jour. Am. Med. Assoc., July 25, 1903.

The following are the steps of the operation: "1. Transverse elliptical incisions are made surrounding the umbilicus and hernia; these are deepened to the base of the hernial protrusion. 2. The surfaces of the aponeurotic structures are carefully cleared $2\frac{1}{2}$ to 3 inches in all directions from the neck of the sac. 3. The fibrous and peritoneal coverings of the hernia are divided in a circular manner at the neck, exposing its contents. If intestinal viscera are present, the adhesions are separated and restitution made. The contained omentum is ligated and removed with the entire sac of the hernia and without tedious dissection of the adherent portion of omenta. 4. An incision is made through the aponeurotic and peritoneal structures of the ring, extending one inch or less transversely to each side, and the peritoneum is separated from the under surface of the upper of the two flaps thus formed. 5. Beginning from 2 to $2\frac{1}{2}$ inches above the margin of the upper flap, 3 or 4 mattress sutures of silk or other permanent material are introduced, the loop firmly grasping the upper margin of the lower flap; sufficient traction is made on these sutures to enable peritoneal approximation with running suture of catgut. The mattress sutures are then drawn into position, sliding the entire lower flap into the pocket previously formed between the aponeurosis and the peritoneum above. 6. The free margin of the upper flap is fixed by catgut sutures to the surface of the aponeurosis below, and the superficial incision closed in the usual manner. In the larger hernia the incision through the fibrous coverings of the sac may be made somewhat above the base, thereby increasing the amount of tissue to be used in the overlapping process." In the discussion of this paper the method was heartily indorsed by a number of surgeons. (For Mayo's previous paper see YEAR-BOOK, 1903.) [We have employed this operation with much satisfaction.]

The **operative treatment of umbilical hernia** is dealt with by J. Collins Warren¹ (Boston), who describes an operation which he first employed in 1890. Attention is directed to the fact that the shape of the opening in the abdominal wall after reduction or excision of the contents and excision of the sac represents an oval with the long diameter lying at right angles to the linea alba, and that, therefore, it is easier to close the opening by bringing the upper and lower edges together than by attempting to approximate the two lateral edges, the tension being much less when this is done, the parts seeming to fall naturally together when the opening is closed transversely. A new feature in the treatment of these cases consists in the extensive excision of the thick layer of adipose tissue, especially from the fold below the umbilicus which overhangs the mons Veneris. This latter step has been practised in 2 cases with very satisfactory results. Warren reports 12 cases in which he has operated after the method described. There was a cure in all the cases excepting 2, in one of which the operation followed closely upon a reduction of a strangulated hernia. This case furnished conditions unfavorable to strict asepsis, and recurrence in this case may, therefore, be ascribed to sepsis rather than to the method adopted.

¹ Boston M. and S. Jour., Oct. 8, 1903.

In a paper entitled **the cure of the more difficult as well as the simpler inguinal ruptures** Halsted¹ describes the operation which is at present performed at the Johns Hopkins Hospital and which is the result of many changes and improvements during the past 14 years, in which period more than 1000 operations have been performed. Halsted has made some of the improvements, but credits his assistants, especially Bloodgood, with many of them. The operation is divided into 9 steps, which are excellently illustrated. (1) The first consists in the division and reflection of the aponeurosis of the external oblique. (2) The cremaster muscle and fascia are split a little above the center of the cord. (3) The internal oblique muscle is made as free as possible. Here a little artefaction is often necessary. If this muscle cannot be readily brought down to Poupart's ligament, one or two relaxation cuts may be made in the anterior sheath of the rectus, under the aponeurosis of the external oblique. This should not be done, however, until the sewing of this muscle to Poupart's ligament is begun, when the amount of tension can be accurately discerned. (4) When the veins are large,—and they usually are,—they should be excised with great care in order to avoid even the slightest extravasation of blood into the tissues about the smaller veins and about the vas. The vas itself should not be raised from its bed or handled, or even touched, lest thrombosis of its veins occur. (5) Ligation of the sac by transfixion or the purse-string suture at the highest possible point. After ligation the ends of the suture are threaded on long curved needles and carried far out under the internal oblique muscle from behind forward, and, passing through this muscle about 5 mm. apart, are tied. This idea of treating the sac was suggested by Kocher's operation. (6) The lower flap of the cremaster muscle and its fascia are drawn up under the mobilized internal oblique muscle and held in this position by very fine silk stitches which are carried all the way through the internal oblique. (7) The mobilized internal oblique muscle with the conjoined tendon are sutured to Poupart's ligament as in the Bassini or Halsted operations. Catgut is usually employed for this suture. (8) The aponeurosis of the external oblique muscle is overlapped. This step is known as Andrew's method, but was devised independently by Halsted. (9) The skin is closed with a buried continuous silver suture and the incision covered with 5 or 6 layers of silver foil. Halsted discusses at some length the change from transplantation of the vas to leaving it undisturbed. He shows very clearly, by results in a certain series of cases, that the results are better where the vas is simply depressed and allowed to escape at the external ring than where it is transplanted. Excision of the veins with transplantation of the vas not infrequently resulted in the formation of a small hydrocele, and in about 10 % of the cases atrophy of the testicle. This atrophy, however, was observed only in cases complicated by a very considerable swelling of the epididymis; consequently, the great care which is exercised at the present time to avoid any injury of the veins which are left. The use of the cremaster muscle in the way described

¹ Johns Hopkins Hosp. Bull., Aug., 1903.

is found feasible in about 75 % of the cases and is considered of great value. Halsted refers to a case in which closure of the inguinal canal was made solely by the cremaster stitched over instead of under the internal oblique. The result in this case was perfect. Halsted states that since the publication of his second paper, June, 1892, there has not been a single recurrence in the cases upon which he has operated. He describes also a modification which consists in the reflection of a portion of the aponeurosis of the rectus where closure of the defect is difficult.

R. Hamilton Russell,¹ who previously (see YEAR-BOOK, 1903) constructed a lengthy article on the congenital origin of femoral hernia, now presents an address upon the **congenital origin of hernia**, paying especial attention to **inguinal hernia**. Femoral hernia Russell believes results from the existence of a sac arising in an early stage of development when the limb buds are being formed. At this early stage of development it is suggested that a diverticulum of the pleuroperitoneal cavity is drawn down into the limb. Russell believes also that inguinal hernia is due to this same saccululation of the peritoneal pouch. The interstitial and properitoneal hernias result from portions of peritoneum being caught in the abdominal wall during its development. Russell lays great stress upon a case in which there was a peritoneal pouch in the situation of a direct inguinal hernia although no hernia had ever been present.

J. W. Seaver² describes a **method of curing inguinal hernia by exercises**, and reports a number of cases illustrating his remarks. He stated that 3 % of college students have oblique inguinal hernia, and an examination of the Yale students showed that in about 16 % of those having a hernia a truss was worn, the majority being unaware of the existence of the hernia. Seaver goes on to state that a patient may develop the power of contracting particular parts of the abdominal wall, and that, by going through certain exercises which develop the muscles of the lower abdomen, the cure of hernia may be established. The truss is worn during the treatment, but after two or three months a flat pad is substituted for the ordinary convex one. Occasionally vigorous massage of the inguinal region may be added to the treatment. The best results were obtained in patients who were inclined to indulge in athletic exercises. Seaver states that he has been successful in curing this condition in 75 % of the patients under 25 years of age. He, however, refers to a case of a man 38 years of age in which a cure was established by this treatment.

Bégoine³ discusses the **various operations for the radical cure of inguinal hernia** and shows a **preference for that of Mugrai**. In this operation the cord is depressed behind the entire inguinal canal and allowed to make its exit through the external abdominal ring; the walls of the inguinal canal are then approximated and the canal thus obliterated. When this operation is done, the internal ring is entirely obliterated, thus doing away with the weakest point in the region, and

¹ Lancet, Mar. 12, 1904.

² Yale Med. Jour., Feb., 1904.

³ Jour. de Med. de Bordeaux, Sept. 6, 1903.

that at which most recurrences take place. The cord makes its entrance at a point where hernia is not apt to take place, as it is well fortified by strong tissues. [This is apparently the method devised by Fowler a number of years ago.]

Steffen¹ presents a lengthy report on the results obtained in the treatment of reducible hernia by alcoholic injections after the method of Schwalbe. Between 1886 and 1902 Steffen has treated 1052 patients with 1372 hernias. Because of incomplete treatment, disappearance of patients, and other causes, however, only 901 patients and 1182 hernias are considered in the discussion. Of these, 88.15 % were inguinal; 7.02 % crural; 3.9 % umbilical; and 9.93 % hernia of the linea alba. The immediate results were as follows: Cured, 75.3 %; improved, 7.1 %; not cured, 17.6 %. It should be noted, however, that by "cured" Steffen means the hernia was neither visible nor palpable in either sitting or recumbent position, upon coughing and pressure. The alcohol is injected about the neck of the sac, but not into it, and as a result of the injection there is an area of hardness about the site of puncture. The shortest treatment of any case was 1 year and the longest 4 years. The injections were made at various periods, in the intervals the patient wearing a truss. Where the orifice was large, daily injections were made. One hundred and seventy-eight cures have persisted from 11 to 16 years; 305 from 6 to 10 years; 221 from 1 to 5 years. In 77 cases the cure was complete when death ensued or the patient disappeared. Of those counted as cures 111, or 12.5 %, relapsed. Unfortunate accidents in this treatment are extremely rare, but it cannot be said to be without danger, the mortality being 0.04 %. [We feel that these figures alone are sufficient to convince the reader that this form of treatment cannot be compared with the operative treatment for the radical cure of hernia. We believe that if the treatment of reducible hernia is contraindicated for any reason or will not be permitted by the patient, the best plan of treatment is the wearing of a truss. Certainly the injection treatment described by Steffen, if it fails to cure, will render operative treatment very difficult and uncertain. This opinion is based on some experience in operating upon cases in which cures had been attempted by the injection method.]

Willard Bartlett² describes an improved filigree for the repair of large defects in the abdominal wall. After consideration of former filigrees which have been employed he states that he believes it to be unnecessary to have the wires cross one another, dividing the filigree into small squares, but that if the wires run parallel to one another across the vent in the abdominal wall, the filigree will be less stiff and interfere less with the mobility of the abdominal wall. The illustration (Fig. 14) shows the filigree recommended. It is unnecessary to fix each of these loops with sutures; a few sutures may be introduced for the purpose of keeping the filigree in position while the other structures are sutured, but it is shown that there is little or no tendency to displacement after it is once put in position. The filigree should be placed next to the peri-

¹ Samml. klin. Vorträge, 1904, No. 369.

² Ann. of Surg., July, 1903.

toneum. Under no circumstances should it be placed on top of the aponeurosis of the external oblique. Seven cases are reported in which Bartlett has used some form of filigree with good results. In several of these cases the abdominal wall at the point of operation consisted only of peritoneum, filigree, and skin. The filigree should be made at least one and one-half times longer than the scar which it is to replace. The filigree can be made of the desired size by stretching silver wire over nails driven through a board.

Frederick Kammerer¹ discusses the **recent operations for the radical cure of femoral hernia** and believes that that described by Lotheissen in 1898 and by Gordon in 1900 is probably the best. The operation as described by Lotheissen consists in the following steps: "1. An incision parallel to Poupart's ligament and a little above the same, dividing the fibers of the external oblique. This incision extends into the external inguinal ring. 2. Exposure of the neck of the sac by entering between Poupart's ligament and the internal oblique muscle. 3. Dislocation of the sac by pulling the same, if small, into the opening above Poupart's ligament. 4. In large hernias dissection of the skin at the lower edge of the original incision, exposure of the external surface of the sac, incision and reduction of its contents into the abdominal cavity, deligation and removal of the sac, and finally dislocation of the stump of the sac in the manner previously described for small hernias. 5. Suture of the edge of the transversalis and internal oblique muscles to Cooper's ligament. 6. Suture of the incisions in the aponeurosis and the skin separately." An

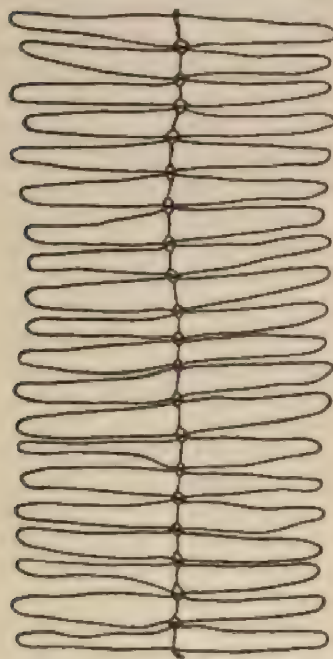


Fig. 14.—Filigree for the repair of large defects in the abdominal wall (Bartlett, in *Ann. of Surg.*, July, 1903).

article by Gilli states that this operation has become the typical one for femoral hernia in von Hacker's clinic. Gilli recommends the division of Poupart's ligament after incision of the aponeurosis of the external oblique in cases of strangulation. Tuffier, however, made the same recommendation in an article published some time previous to that of Gilli. Kammerer approves of this suggestion and has found it useful in a case of strangulation. The essential feature of the operation consists in the attachment of the internal oblique and transversalis muscle to Poupart's ligament. Various incisions have been made for the performance of this operation, but Kammerer believes that the incision

¹ *Ann. of Surg.*, June, 1904.

parallel with Poupart's ligament and about $\frac{1}{4}$ of an inch above it is the best. In reducible hernia it is unnecessary to expose the sac from its crural aspect, since in such cases it can always be drawn up through the femoral ring. In large, nonstrangulated hernias it will be more advisable to begin the operation by exposing the sac where it emerges from the saphenous opening. When strangulation is present, Poupart's ligament should be divided from above, regardless of the size of the hernia. Such division is much more satisfactory than the old method of cutting blindly from below. Kammerer states that he believes the Lotheissen-Gordon method to be based on the best anatomic and mechanic principles and worthy of a more extensive employment.

H. Betham Robinson¹ describes an interesting case of **properitoneal hernia**. The patient was a man 54 years of age who had for many years worn a truss for a left inguinal hernia; the truss had apparently retained the hernia and it had given rise to no discomfort. Three days before admission to St. Thomas's Hospital the patient developed symptoms of obstruction. This was well marked upon his admission, but no cause for it could be found. The abdomen was opened in the median line below the umbilicus. A loop of small gut and matted omentum were found entering through a small opening into a pouch situated under the left abdominal wall and to the side of the bladder. The edge of the opening was divided and a congested omentum was withdrawn. It was impossible, however, to withdraw the bowel. When the finger was introduced, the latter was found to be adherent to the sac. An incision was then made in the inguinal region and an empty hernial sac encountered. On following this up to the internal ring the opening in the former sac, with the bowel protruding, was found. The bowel was firmly adherent, quick black, and tore easily on attempts at separation. The internal opening was then isolated with gauze packs, the adherent loop of intestine separated and withdrawn through the internal ring and brought out externally through the abdominal wound. Four and one-half inches of gangrenous bowel were then resected and an end-to-end anastomosis made. The patient collapsed about one hour after the operation and died the next day. The necropsy report, which possibly throws some light on the etiology of this form of hernia, showed the following condition: "The inguinal sac extends down the canal to just below the external ring; it is in the substance of the cord, the pampiniform plexus being in front and to the outer or left side of the sac, while the vas deferens, with its closely related vessels, is behind and to the inner side. The testis was normally placed in the scrotum. This inguinal sac has a comparatively small opening at the situation of the internal ring into the sac placed behind the abdominal wall. This inner sac is of oval form, with its long axis parallel with the direction of Poupart's ligament; it is markedly convex posteriorly, and measures in its long axis $1\frac{1}{2}$ inches, and in its transverse axis $2\frac{1}{4}$ inches. The inner sac is closely packed to the left side of the bladder, the lower and inner part of the sac being in contact with the pelvis and in relation in front with the lower part of the peritoneum."

¹ Brit. Med. Jour. Mar. 12, 1904.

In the inner third of the upper half of the sac posteriorly is a circular opening, of about 1 inch diameter, with a very sharply defined margin; this opening corresponds in front with the outer edge of the lower part of the rectus. On the outer side the sac extends into the iliac fossa, resting on and just passing beyond the external iliac vessels; the deep circumflex iliac vessels are to be seen coursing around the outer pole of the sac as they make their way outward. The sac has an opening in front through which it is continuous with the sac in the inguinal canal, the two forming a bilocular cavity. This anterior opening is placed at the junction of the outer and middle thirds of the sac and to the outside of the deep epigastric artery. Just to the inner side of the internal opening is a small fold of peritoneum passing over the sac to the side of the bladder; this does not, however, appear to be related with the course of the obliterated hypogastric artery. To the inner side of the upper part of the sac is a very small peritoneal fossa. From the lower part of the back of the sac another peritoneal fold is seen passing to the sigmoid loop running just external to the true brim of the pelvis."

Robinson divides bilocular hernia in the inguinal region into 2 groups—those in which both loculi are in front of the transversalis fascia, of which there are several examples, and those in which the deep sac is behind the transversalis fascia. Of the second variety are the properitoneal hernia of Krönlein and the prevesical hernia. It is to the properitoneal variety that the present case belongs. Whether the testis is normally descended, imperfectly so, or not at all, nonobliteration of the processus vaginalis, especially in the vicinity of the internal ring, is a very potent factor in the production of this form of hernia; by the attempted shutting-off at the internal ring there is formed a small rigid opening, oval or rounded in shape. Robinson shows that any attempt at contraction or obliteration of a congenital sac beyond the internal ring may tend to the development of a properitoneal hernia behind it, and that, therefore, an undescended testicle and a congenital hernia may be the forerunners of a properitoneal hernia of this kind. The distention of the intraabdominal portion of the sac which lies in a loose bed of subperitoneal connective tissue is facilitated by the resistance offered by the abdominal muscles to the dilation of that part of the process in the inguinal canal. Streubel maintained that the properitoneal sac develops after the establishment of the usual inguinal hernia. What conduces to this formation is—(1) The constricted opening at the inner ring hinders the return of the contents of the sac into the peritoneal cavity; (2) the reduction of these contents, especially if pushed back roughly by the patient or crowded back by a badly fitting truss, causes the peritoneum to be loosened about the inner ring and to be pushed backward; the hernial contents then distend laterally the peritoneum in the subperitoneal tissue and thus form a properitoneal sac. Tessier's opinion was that there was a reduction *en masse* of sac and contents behind the transversalis fascia and secondary pouching again into the inguinal canal; this origin is also maintained by Gosselin. Nothing more definite can be said regarding the cause of this form of hernia than that in the

majority of cases there appears to have been defective closure of the processus vaginalis and in a large proportion of those there is imperfect descent of the testis. Attention is called to the fact that in the present case there was a small diverticulum to the inner side of the sac, agreeing with those described by Rokitsansky and upon which Bär had laid stress as a factor in the causation of this form of hernia.

C. G. Cumston¹ (Boston) discusses **epigastric hernia** and reports a number of cases. These hernias occur between the umbilicus and xiphoid cartilage and usually near the middle line. The condition is supposed to be largely due to certain changes which take place in the structures of the abdominal wall. It will be frequently discovered that a congenital or acquired diastasis of the recti has been present. Another causative factor upon which stress is laid is the properitoneal lipoma. As these small fatty tumors develop they draw the peritoneum after them in between the muscle-fibers. Often they draw the peritoneum through without the escape of any of the abdominal contents. In other cases the omentum or bowel may protrude. The contents usually consist of omentum only. Strangulation is very infrequent in epigastric hernia. The hernia can best be detected when the patient is standing with the trunk bent forward.

Eustace Smith² also reports a case of **diaphragmatic hernia** occurring in a male child 2 years of age. The child died of pneumonia, and the hernia was found postmortem. The tendon of the diaphragm was stretched out over the protrusion (there was no rupture of the tendon) in the right side of the chest and formed a sac of about the size of a large hen's egg. The mouth of the sac was not constricted and it contained about half of the stomach, including the cardiac and pyloric orifices, so that the finger could be passed straight into the sac from the esophagus or from the duodenum. Most of the greater curvature of the stomach was outside the sac. There were no adhesions and the hernia was readily reduced. There was also some omentum in the sac. The stomach and the intestines were natural. It can be seen that the hernia was in no way the cause of the child's death. Attention is also called to the fact that the outer sac was formed by a bulging of the tendinous portion of the diaphragm and was on the right side in spite of the presence of the liver.

F. Bolton Carter³ reports a case of **ruptured bladder and diaphragmatic hernia**. The patient was a man 34 years of age who was crushed by a safe weighing 2 tons. He was admitted to the hospital 5 hours after the accident and was greatly collapsed and complained of pain over the sacrum and coccyx. A catheter introduced drew off several ounces of blood-stained urine. At this time no evidence of a fractured pelvis could be obtained. The next day there was evidence that there had been an extraperitoneal rupture of the bladder, and a suprapubic opening was made by Bond. A perineal section was also done and the bladder drained from below. The patient reacted well from the opera-

¹ N. Y. Med. Jour., Apr. 30, 1904.

² Lancet, May 21, 1904.

³ Brit. Med. Jour., June 25, 1904.

tion and continued to improve until the fourth day after his admission, when he complained of sudden acute pain in the left side of the chest and abdomen, which was followed by collapse, cyanosis, and death within half an hour. A necropsy was performed and the left pleural cavity found to be occupied by the stomach, transverse colon, and 8 feet of jejunum. In the diaphragm was a rent extending from the esophageal opening forward and somewhat to the right, large enough to admit the closed fist. There was also a fracture extending through the distal end of each pubic ramus. The other organs were uninjured. As the patient never gave a symptom of any such condition during life, it is evident that the abdominal viscera could have passed into the pleural cavity only shortly before death, but the tear in the diaphragm was probably made at the time of injury. Possibly the rent was not complete, but gave way later through some straining effort of the patient. No signs of intestinal obstruction were ever present.

E. W. Selby¹ reports a case of **right duodenal hernia** occurring in a man 40 years of age. The patient was operated upon on the fourth day after the onset of symptoms of acute obstruction of the bowels. It was thought that the obstruction was probably due to a band. When the abdomen was opened, a large peritoneal sac was found which occupied the right half of the abdomen. The orifice in this sac was just to the right of the middle line, a little below the umbilicus, and measured $2\frac{1}{2}$ inches by 1 inch. The free anterior margin of the orifice was thick and rounded and contained vessels. This margin was divided between ligatures and a quantity of small intestine withdrawn. The sac was then freely opened and a portion of it cut away. Portions of the bowel were very much congested. The patient did not rally, but died 20 hours after operation. A necropsy was performed and the opening into the sac was found just below and to the right of the duodenojejunal flexure. A few coils of the upper jejunum were adherent to the inner surface of the sac and the omentum was adherent to a portion of the outer surface. It is thought that the whole of the small intestine except the last 8 inches of the ileum had been in the sac. Judging from the adhesions between the intestines and the sac the hernia was probably of prolonged duration. The ileum had evidently been constricted for some time at the point of emergence from the sac. In this connection the history which the patient gave of previous attacks of abdominal pain and vomiting was interesting. The report is followed by some remarks on the case of Moynihan, who concurs in the diagnosis of right duodenal hernia. The vessel contained in the anterior margin of the orifice of the sac he says was the superior mesenteric artery. There are 2 forms of right duodenal hernia. In the first the fossa of Waldeyer exists in association with an adherent jejunum. The upper 3 or 4 inches of the jejunum are fused to the posterior abdominal wall. In the second the fossa exists in the uppermost portion of the mesojejunum, close to the duodenum. Moynihan has found in all 14 recorded cases, and, curiously enough, they show 7 examples of each of the 2 forms.

¹ Brit. Med. Jour., Mar. 12, 1904.

Two cases of left duodenal hernia, in one of which the sac contained the entire small intestine, the cecum, and a portion of the colon, which was strangulated, are reported by Leonard Freeman¹ (Denver). He first refers to the anatomy of this variety of hernia and to the literature of the subject, especially the work of Moynihan. Strangulation is unusual in this variety of hernia, Jonnesco having found mention of but 8 cases in the literature of the subject. The first case reported by Freeman is that of a man 47 years of age. The patient had always had good health excepting occasional slight indefinite abdominal pains. Following an attack of diarrhea which lasted 3 weeks there developed suddenly, 4 days before Freeman saw him, a severe ileus with the usual symptoms of acute intestinal obstruction. Immediate operation was performed. The patient was in a bad condition, the pulse being 120, of poor quality, the temperature subnormal, and the capillary circulation poor. When the abdomen was opened, it was found to be occupied by an immense tympanitic tumor resembling an ovarian cyst. The hand could be passed between the tumor and the abdominal wall, and no small intestine was to be seen. The colon could be felt below and to the right side. The sac was opened and within was found the entire small intestine, the cecum, and 6 or 8 inches of the colon. It also contained considerable foul, bloody, serous fluid, no trace of which existed outside of the sac, showing how completely the inner cavity was separated from the outer. The cecum was greatly distended and was gangrenous. It lay in the left upper quadrant of the abdomen, just beneath the spleen. The appendix was swollen and was attached by recent inflammatory adhesions. In tracing the colon from below upward it was found to emerge from the pelvis on the left side and then pass directly across the lower portion of the abdomen, coiling itself loosely in the right iliac fossa and right lumbar regions. It then entered the sac through an opening on the right side posteriorly, and was strangulated at its point of entrance. In order to relieve the condition it was found necessary to resect the gangrenous cecum together with some 6 inches of the large intestine and a considerable portion of the small bowel. A lateral anastomosis with the Murphy button was then done. The patient did not recover from the operation. Freeman has been able to find no other instance of the presence of a portion of the colon in the sac of a duodenal hernia. In fact, it is considered by some authorities never to occur. Another peculiar condition was the fact that the entire colon lay in folds on the right side of the abdomen instead of encircling the hernial sac, as was to be expected. In the formation of a postperitoneal hernia such as the one under consideration the duodenum enters the opening first, dragging after it the jejunum and then the ileum with their mesentery. The cecum, being attached to the lower end of the ileum, would enter last. The second case reported was encountered during an autopsy, the patient having died from gangrene of the small intestine accompanied by severe hematemesis and melena, arising from thrombosis of the mesenteric and portal veins, which in its turn was dependent upon a hobnail liver, the hernia being in no way

¹ Am. Jour. Med. Sci., Oct., 1903.

concerned in the death. The sac filled the entire left side of the abdominal cavity and pushed well over to the right of the median line. It contained all but 6 inches of the small intestine, the transverse and descending colon being spread out upon its upper and left outer surface, leaving the ascending colon and cecum in their normal position. The mouth of the sac was round and smooth and easily admitted 3 fingers. From it emerged the lower end of the ileum to join the cecum in the right iliac fossa. The opening was just to the right of the vertebral column, on a level with the crest of the ilium and toward the dorsal and inferior portion of the sac. Its free ventral border was occupied by the inferior mesenteric vein, while the left colic artery ran much further to the left, along the posterior abdominal wall. The small intestine, which appeared to be unusually short, was arranged in regular parallel folds, like a Mikulicz drain, running from the left below to the right above. The omentum was short and thick and pushed to the right side above the sac. There was no strangulation of bowel or mesentery.

L. W. Hotchkiss¹ discusses **partial enterocoele** and reports 6 cases. The cause of this condition has never been definitely settled. It presents itself as a form of strangulated hernia most dangerous because of a lack of typical symptoms. Gangrene, perforation, and general peritonitis even may ensue before the case assumes clinically the appearance of real gravity. A study of the 6 cases reported shows a great lack of uniformity in symptoms and the absence of any pathognomonic sign which would have made an early diagnosis reasonably certain. There was a marked disproportion between the severity of the earlier symptoms and the real gravity of the case.

H. J. Curtis² describes a case of **hernia of the bladder associated with inguinal hernia** and refers to 3 other recent cases. The case reported was operated upon by Bilton Pollard. The patient was a boy 2½ years of age. When the sac was opened, it was found empty, but bulging into the back of it was seen a globular swelling about ½ inch in diameter (Fig. 15). The sac was carefully removed from this mass, which was found to be cyst-like and presented the appearance of muscle-fibers over it. It was entirely devoid of peritoneal covering excepting that given it by the sac of the hernia. Further examination showed that it came into the canal through the enlarged internal ring. It lay internal to and partly behind the neck of the sac. A diagnosis of hernia of the bladder was made and confirmed by the passage of a sound. It was pushed backward and downward and the inguinal canal obliterated by the usual Bassini method. The accompanying illustrations (Fig. 16) show the way in which hernia of the bladder may occur, and the last figure, No. 4, represents the condition found in the present case. The case recorded is decidedly rare because the bladder was covered only with peritoneum derived from the sac of the hernia into which it protruded, but the bladder has also been known to descend without a covering of peritoneum and without bulging into the hernial sac. In the majority of instances a diagnosis of this condition is made only at the time of the operation. In some

¹ Ann. of Surg., Feb., 1904.

² Brit. Med. Jour., July 11, 1903.

cases, however, a cyst-like swelling, dull on percussion and which can be emptied by pressure, sometimes causing a desire to micturate, has been observed in immediate relation with inguinal hernia. Sometimes also the patient is able to micturate only with difficulty until the hernia is reduced. Taylor has reported a case in which a diagnosis was made by the passage of a sound. When the presence of the bladder is recognized in connection with an inguinal hernia, it should be treated in the manner pursued by

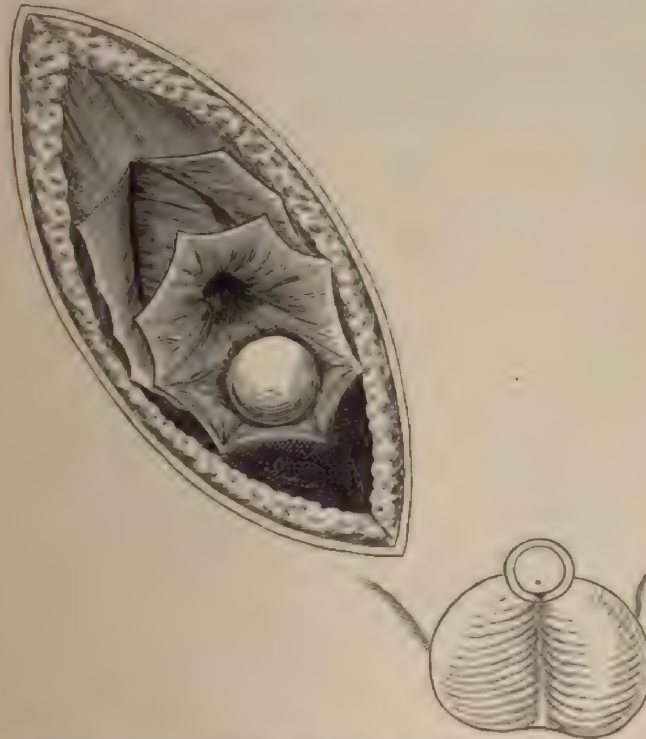


Fig. 15.—Semidiagrammatic, prepared from a sketch at Mr. Pollard's operation for radical cure of a right inguinal hernia, into the back of the sac of which a protrusion of the bladder was found bulging. [H. J. Curtis.] For the sake of clearness, the spermatic cord and other unnecessary details have been omitted. Beneath the skin incision and fat are seen, successively, the slit up and reflected edges of the aponeurosis of the external oblique muscle, the internal oblique muscle, escaping from beneath which, through the enlarged internal abdominal ring, is the hernial sac here shown opened out after its lower extremity has been cut off. Bulging through the posterior wall of the sac is seen a rounded swelling. On reflecting the sac off this, it was found to be finely striated and evidently muscular on its surface, and to be a protrusion of bladder herniated through the internal ring, internal to and slightly beneath the true hernial sac, invaginating the posterior wall so as to produce the appearance here figured. The course of events is rendered still clearer by a reference to the series of diagrams (Fig. 16) (Curtis, in Brit. Med. Jour., July 11, 1903).

Pollard. If it is wounded, it should be closed and the radical cure proceeded with, allowing, however, for drainage in case of leakage. Evidences of injury to the bladder may not develop for some time after the operation. When it occurs, drainage should be immediately instituted. In the case recorded the patient made a good recovery. In 3 others referred to, however, the patients died. In one case the protruding

bladder was excised in mistake for the hernial sac; in another case it was deliberately excised; and in the third case the stitches penetrated too deeply and wounded the bladder.

G. R. Ferguson¹ also reports a case of **hernia of the bladder complicating an inguinal hernia**. The hernial sac contained a large amount of omentum with a small knuckle of the transverse colon. A portion of omentum weighing several pounds was removed and the neck of the sac closed. Its total extirpation was impracticable because of extensive adhesions. At the end of the operation a thin, blue, and distended cyst about the size of a pigeon's egg was noticed in immediate proximity to the spermatic cord and adherent to the remains of the sac. It was mistaken for a hydrocele of the cord and was punctured. The

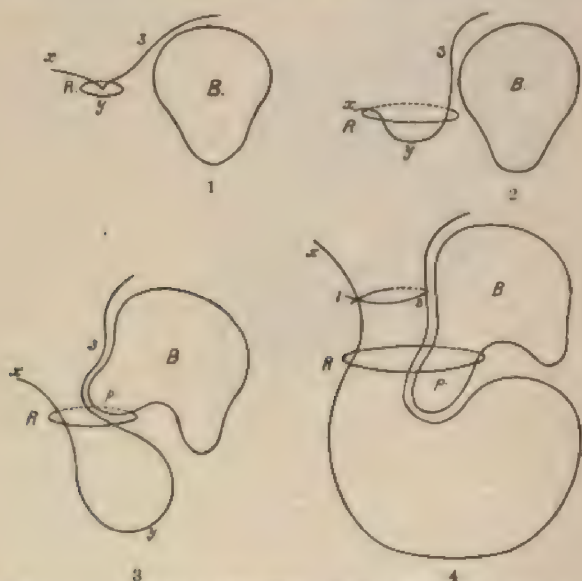


Fig. 16.—These diagrams, suggested by Mr. Bilton Pollard, illustrate the mode of occurrence in many cases (Curtis, in *Brit. Med. Jour.*, July 11, 1903).

fluid escaping proved to be urine, and hernia of the bladder was confirmed by the introduction of the finger. The wall of the cyst was extremely thin and consisted of little more than attenuated mucous membrane. The wound was closed, a catheter was tied in the bladder for a few days, and the patient made an uneventful recovery. The hernia was extraperitoneal, and it is thought that its occurrence may be attributed to the fact that the patient had been operated upon before for the cure of the hernia and the wound had suppurated, probably producing adhesions between the remains of the sac and the bladder. In the redescend of the sac the bladder was brought down with it.

Jopson² (Philadelphia) reports an interesting case of **hernia of the uterus through the inguinal canal**. The patient was a woman 27

¹ *Brit. Med. Jour.*, July 25, 1903.

² *Ann. of Surg.*, July, 1904.

years of age who had had 3 children. For a long time she had had a small right inguinal hernia which was reducible and gave her no trouble. She had never worn a truss. One week before admission, while washing, the hernia suddenly became much larger and the patient suffered severe pain. Upon admission there was a swelling, one-half the size of a fist, protruding from the external abdominal ring and extending down into the labium. A diagnosis of epiplocele was made. When the sac was opened it was found to contain the uterus with the appendages of the right side. The uterus was quite friable. At first it was mistaken for a mass of omentum, and in an endeavor to unroll it the organ split longitudinally and three-quarters of an ounce of yellow, odorless pus escaped from the interior of the organ. The true condition was then recognized. A vaginal examination, together with the presence of the ovary and tube in the sac, completed the diagnosis. The uterus was amputated above the cervix and was removed with the right ovary and tube. The stump was fixed in the inguinal canal. The woman made a prompt recovery. Menstruation appeared promptly and was normal. The wall of the uterus examined microscopically showed evidences of inflammatory degeneration. In discussing hernia of the uterus Jopson states that the ventral forms occur most frequently. The pregnant uterus has occupied the sac of an inguinal hernia in whole or in part 9 times; the nonpregnant uterus has been previously observed in inguinal hernia at least 12 times. Two undisputed cases of crural hernia of the nonpregnant uterus have also been recorded. A herniated uterus may become impregnated in its new position, and it is possible for pregnancy to go on to full term. Multiple pregnancies are an important predisposing factor to hernia of the uterus. In a relatively large proportion of cases there is a congenital deformity of the organ. Although both ovaries may accompany the uterus, there is usually only one present in the sac with it. Hernia of the uterus has been diagnosed correctly before operation. Jopson considers that the uterus in this case was practically strangulated. In addition to the present cases, 8 other operations have been performed for hernia of the nonpregnant uterus, notes of which are appended. In Jopson's case the stump was fixed in the canal because of the pressure of pus in the uterine cavity and infiltration of its walls.

Barbat¹ (San Francisco) records 2 cases of **strangulated femoral hernia containing the appendix**. The first patient was a woman 66 years of age. The hernia was on the right side. The contents of the sac consisted of the appendix, which was large, inflamed, and perforated near its tip, an appendolith which was lying in a small circumscribed cavity, and the mesoappendix, which was hypertrophied. The base of the appendix filled the femoral ring, and because of this and the fact that suppuration was present it was detached from the ring but allowed to return to its position, the appendix being removed and the stump cauterized. The patient made a good recovery. The strangulation in this case was secondary and due to the swelling which followed the inflammation of the appendix. The second patient was also a woman, 69

¹ Jour. Am. Med. Assoc., Feb. 27, 1904.

years of age. In this case the hernia was acute and on the right side. The sac contained about 2 drams of bloody serum and the appendix doubled upon itself and strangulated. The tip of the appendix was gangrenous. The cecum was drawn down into the wound, the appendix removed, and the stump inverted.

An interesting case of **strangulated hernia associated with acute hemorrhagic pancreatitis** is recorded by W. H. Brown.¹ The patient was a man 60 years of age. He had had no illness of any kind up to the time of admission, when he was seized with sudden pain in the lower part of the abdomen. The pain was intense and he vomited several times. The bowels did not move nor did he pass any flatus. On admission the abdomen was distended and tender. The scrotum contained a large double hydrocele and an irreducible inguinal hernia on the right side, examination of which produced great pain. Shortly after admission he vomited material with a fecal odor. He was anesthetized, the hernial sac opened and found to contain a loop of small intestine deeply congested, but not gangrenous. The operation did not relieve the symptoms and the patient died 24 hours later. At the necropsy it was found that the death had been caused by an acute hemorrhagic pancreatitis.

R. A. Stirling² (Melbourne) discusses the **management of gangrenous bowel in operations for strangulated hernia**. He first calls attention to the fact that it is next to impossible to diagnose gangrene of the bowel before operation. Time is of little value as a test. Stirling has seen the bowel black and gangrenous after 6 hours from the commencement of the prolapse. The symptoms vary greatly. Patients with gangrenous hernia have often walked into the hospital without a display of any of the classic symptoms. Stirling is a strong advocate of resection of the gangrenous bowel at the time of the primary operation, believing that the best results can be obtained in this way. In his recent cases he has employed the suture rather than any of the mechanic devices for making an anastomosis. He repeats the admonition of Murphy that the bowel should be resected well above the point of obstruction, where the gangrene is most likely to spread. The paper concludes with a report of cases.

Percy W. G. Sargent³ reports 3 cases of **intestinal obstruction due to fibrous stricture consequent upon strangulated hernia**, and discusses the subject at some length. Stricture after the successful reduction of a strangulated hernia is rare and is by no means dependent upon the duration of the strangulation, the duration of the strangulation varying in the reported cases from 14 to 72 hours. In most instances the stricture has been single and extensive. The single stricture, whether or not involving the whole circumference of the bowel, results from necrosis due to temporary interference with the arterial supply of the loop. Double stricture is caused by cicatrization resulting from direct local damage at the site of strangulation. The annular stricture is the less common variety because damage sufficient to produce any considerable degree of cicatrization would rarely be arrested at this point,

¹ Lancet, Sept. 26, 1903.

² Inter. Med. Jour. of Australasia, Dec. 20, 1903.

³ Ann. of Surg., May, 1904.

but would either lead to extensive necrosis with subsequent perforation, or would guide the surgeon to anticipate such a calamity by resection or some other means. Obstruction may be brought about in any of the 5 following ways: "1. The actual lumen may become progressively narrowed so as to cause symptoms of varying severity. 2. Indigestible substances may become impacted above the stricture. In one instance a mass of beans and raisin-seeds was found; in another, a number of orange-pips and currants. 3. Adhesions to the parietes or to neighboring viscera (the bladder in one case) will add to the dangers of obstruction. 4. Adhesion between the gut above and below the stricture and the formation of a spur. In the case recorded by Nicaise this had occurred in such a manner as to mimic the ileocolic junction. The dilated pouch above resembled the cecum, and the strictured part projecting into its lumen, the ileocecal valve. 5. A sudden kink at the site of constriction may occur independently of adhesions."

In all the reported instances the small intestine has been the portion of bowel involved and the ileum most frequently. The interval elapsing between the strangulation and the commencement of obstructing symptoms has varied from 1 week to 18 years. In the majority of cases the symptoms have been of a chronic nature, terminating acutely. In a very few cases, however, sudden, acute obstruction occurred without previous symptoms. The treatment will depend largely upon the character of the constriction. Where 2 strictures occur at a distance from each other or where the stenosis is too extensive or too complicated for a plastic operation, then lateral anastomosis should be employed. The enteroplasty after the principle of the Heineke-Mikulicz pyloroplasty is the ideal treatment where it is applicable. Some authorities prefer resection. In the first case reported by Sargent there were 2 annular fibrous strictures 2 inches apart in the ileum, about 3 feet from the cecum. The portion of bowel between these two was sufficiently dilated to form a pouch. Both constrictions were pervious, but the lumen was occluded by a kink. A lateral anastomosis was done in this case, but the patient died on the fourth day from a peritonitis. At the autopsy the anastomosis was found to be water-tight. The interval between the strangulated hernia and the obstruction in this case was 18 years. The second case had been operated upon 5 months previously for a left femoral hernia which had been strangulated for 36 hours. In this case the bowel had perforated at the site of the stricture. The patient's condition was so bad that nothing radical could be done, and the coil of bowel was brought outside of the abdomen and the peritoneum cleansed. The patient died in a few hours. A double stricture was present in this case also, and lodged in the pouch between the strictures were some orange-pips and currant-seeds. In the third case, that of a man 70 years of age, there was a history of repeated attacks of abdominal pain with constipation and vomiting extending over a number of months. The patient had worn a truss for 20 years. In this case a single stricture was found in the ileum, 2½ feet from the cecum. The patient made an excellent recovery after an enteroplasty.

J. Hutchings White¹ reports a case of **strangulated oblique inguinal hernia in a child 11 days old**. The first attack of strangulation had occurred on the fifth day, but had been overcome under chloroform anesthesia. It recurred, however, on the eleventh day and could not be reduced. Operation was performed and the patient recovered.

R. C. Dun² reports 4 cases of **strangulated hernia in infants** aged respectively 17 days, 5 weeks, 4 months, and 12 months. In the first patient, aged 17 days, the symptoms of obstruction developed but the child was not sent into the hospital until 72 hours later. He was operated on immediately upon admission. The hernia was a congenital inguinal one, and when the sac was opened, a few drams of blood-stained serum escaped. The bowel was deeply congested but not gangrenous. It was returned and a radical cure done. The child did well for a while after the operation, but died 36 hours later. At the necropsy there was no peritonitis found. A portion of the ileum was deeply congested, smooth, and shiny. On opening the bowel the mucous lining of this strangulated loop showed marked inflammatory infiltration; corresponding to the seat of constriction there was present a most complete ring of small, superficial, irregularly shaped ulcers. The remainder of the mucous membrane of the intestine and stomach was normal. A Meckel's diverticulum was found 2 feet 9 inches from the ileocecal valve. From the apex of the diverticulum a thin fibrous band passed upward and to the right, crossing anterior to the ileum, 5 inches distal to the root of the diverticulum. This band was 2 inches long and was attached to the mesentery, $1\frac{1}{2}$ inches from its free border. There was no adhesion between the band and the bowel, but the gut distal to it was empty and collapsed, as was also the cecum and large intestine, and the bowel above it was slightly distended. It is thought that the obstruction caused by this band probably produced the death. In the next case, that of the 5 weeks' old child, the operation was done 12 hours after the onset of symptoms. The hernia was of the infantile variety, a complete tunica vaginalis testis being present. A radical cure was done and the child made a complete recovery. The third case, that of a male infant 4 months old, had worn a double truss for some weeks. The child was circumcised and all went well until the fifteenth day after operation, when the hernia on the right side came down and the patient suffered great pain. The child was brought to the hospital 18 hours after the onset of symptoms and was operated upon at once. This sac was also of the infantile type and contained the cecum and vermiform appendix as well as a portion of the ileum. The appendix was removed, the bowel reduced, and a radical operation done. The bowels moved twice in the 12 hours following operation and there was no vomiting. The wound healed primarily, but on the fourth day after operation the patient developed a diarrhea which increased in severity, and in spite of treatment caused the child's death 19 days after operation. At the autopsy there was no peritonitis found, but on opening the cecum numerous small ulcers of the mucous coat were seen. These were present in the ileocecal valve but did not extend into the small intestine. The mucous

¹ Med. Rec., Aug. 22, 1903.

² Lancet, May 28, 1904.

lining of the colon was unaffected. It is thought that this ulceration caused the child's death. In the fourth case, that of the 12 months' old child, a truss had been worn regularly but incompletely controlled the hernia. The child was suffering from bronchitis and the hernia came down and was irreducible. Operation was done 10 hours after the onset of symptoms and the child made an uninterrupted recovery. The sac in this case was also infantile.

De Garmo,¹ after discussing **hernia in young children**, gives the following indications for operations on hernia in early life: "1. Strangulated hernia—immediate operation. 2. All cases not controlled by truss. 3. Occasional protrusion with threatened strangulation. 4. When truss-wearing causes pain. 5. On children that cannot be brought regularly for attention. 6. In all cases of femoral hernias. 7. On all children over 7 years of age."

DISEASES OF THE LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN.

In discussing **abscess of the liver in temperate climates** Vrnagnizan² states that although hot climates may tend to the development of liver abscess, the mode of infection is the same as in temperate climates, viz., through the gastrointestinal tract. The difficulty in the diagnosis of liver abscess lies in the great variety of symptoms presented, these depending upon the situation of the abscess and upon its stage of development. Enlargement of the liver, especially in malarial districts, is not of great diagnostic value unless it takes place suddenly. Spasm of the right rectus has never been observed by Vrnagnizan, and marked jaundice was seen but once. Pain over the liver and in the right shoulder is by no means a constant symptom. There is usually intermittent fever. True rigors are never observed, but chilly sensations are frequent. Vrnagnizan prefers drainage of these abscesses through the abdomen by a two-stage operation. At the first operation the liver is fixed to the abdominal wall, and at the second, 8 or 10 days later, the abscess is drained.

The **diagnosis of abscess of the liver** is comprehensively dealt with by T. L. Rhoads,³ of the United States Army. Rhoads examined the records for 2 years of the First Reserve Hospital in Manila, Philippine Islands, in 1901. He found that liver abscess occurred in slightly less than 5 % of the soldiers suffering from dysentery. Attention is called to the fact that the frequency of liver abscess depends to some extent upon locality and upon race. In order to indicate the symptoms a typical case is described. A recapitulation of such a case is given as follows: "The patient gives a history of dysentery contracted in the tropics, and has lost weight; his features are drawn; his complexion is ashy-brown; he suffers with languor, and complains of a dragging pain in his liver; his liver dulness is increased on percussion and has an area of tenderness; his temperature rises in the evening to 100° F. (pure

¹ Med. Rec., Feb. 13, 1904.

² Il Policlin., An. 9, f. 51.

³ Ann. of Surg., May, 1904.

amebic type) or to 102° F. (mixed infection), the corresponding morning temperature being 98° F. and 99° F.; his evening pulse is 95 (pure amebic type) or 110 (mixed infection), the corresponding morning beats numbering 72 and 85. He has a leukocytosis of 12,500, 70 % hemoglobin, and 3,500,000 red blood-cells by count; the subcutaneous veins over the hepatic area are dilated; he has no jaundice or splenic enlargement; there are no friction-sounds over the hepatic area, nor is there bulging of the chest-wall or local edema; cough is not a symptom; basic pneumonia is not present, and there is no dyspnea; the skin is moist; the tongue is coated with a grayish fur, and he is either constipated (post-dysenteric) or has an active chronic dysentery; his urine shows a trace of albumin, and at times casts; he feels chilly, but has no rigors; his brain is clear, but inactive; he is generally an ambulatory case, but feels very much out of sorts, and is willing to resort to anything to be restored to health.

Rhoads¹ also presents a report of a case of **abscess of the liver caused by *Distomum sinense***. The patient was a man 46 years of age, who was well until 8 years previous. While in the Asiatic waters he suffered an attack of sharp epigastric pain accompanied by looseness of the bowels. After this he had numerous attacks of severe pain, and the recent attacks were accompanied by jaundice. During his last attack he was admitted to the Naval Hospital in Washington and a diagnosis of hepatitis was made. Thorough exploration with the needle was made, but with a negative result. Evidences of abscess being clear, however, Rhoads resected a rib and opened a large abscess in the right hepatic lobe. The abscess cavity was found divided into several smaller compartments and the trabeculas dividing them were broken down by the finger. Thorough drainage was established. On the sixth day, when the tube was removed, an examination with the finger revealed 3 concretions, which were removed. On the seventh day, in irrigating the cavity, 3 parasites, each 36 mm. in length, oblong, somewhat flattened and somewhat pointed toward one end, which was cup-shaped, were washed away in the discharge. On examination the parasite proved to be *Distomum sinense*. On successive days 10 more of these parasites were discharged, after which the wound healed without drainage and the patient recovered. Rhoads believes that the parasites invaded the body in 1892, 6 years before the operation, at which time the patient was serving with the Asiatic fleet. The organism makes its way into the body through the ingestion of unclean food and the indiscriminate use of nonsterile water, especially in the Chinese and Japanese ports. The organism after its ingestion finds its habitat in the bile-ducts, where it attains maturity, and the distomum becomes the causal factor of serious hepatic disease. Rhoads believes that the formation of calculi within the intraheptic ducts was a secondary phenomenon due to obstruction of the ducts by the inflammation set up by the distoma.

Albert Lucas² reports a case of **actinomycosis of the liver with gastric ulcers**. The patient was very ill, the abdomen being distended and

¹ Amer. Med., Feb. 6, 1904.

² Birmingham Med. Rev., Jan., 1904.

painful. There was a hard and tender mass in the epigastrium, which extended into the left loin. When the abdomen was opened, an abscess containing about three-quarters of a pint of foul-smelling pus was found, apparently under the left lobe of the liver. The patient rapidly improved for a few days after the operation, but the symptoms returned and the patient died. At the autopsy two healed ulcers were found in the stomach near the lesser curvature. There was not much thickening about the ulcers, and they had not perforated. The left lobe of the liver was very much enlarged, adherent to the diaphragm, and honeycombed with small abscess cavities. The pus from these was thick and pale yellow in color, and when examined microscopically, showed typical actinomyces colonies. Lucas believes that the gastric ulcers were the portals giving access to the fungi. He believes that probably the ulcers were primary, and that, through the solution of continuity in the stomach-wall, the fungi entered and were carried by the portal vein to the liver.

H. Critchley Hinder¹ reports a case of **rupture of the liver** occurring in a boy 15 years of age. The abdomen was opened 2 hours after the accident. A large gaping wound of the liver was discovered, and the bleeding from it, which was profuse, controlled by a gauze pack, while the rent was closed by the application of several sutures. A small wound of the spleen was also found. The patient recovered.

Rutherford Morison² reports a case of **ascites due to cirrhosis of the liver** which was **cured by operation**. The patient was admitted to the Royal Infirmary on February 27, 1899, and was in the medical ward until August 17. During this time 18 gallons 2½ pints of fluid was removed from the abdomen by frequent tapplings, but with little improvement in the patient. At the time of operation, August 29, 1899, the abdomen was very much distended with fluid, and the left side of the scrotum was distended with fluid in a hernial sac. Dilated subcutaneous veins were visible, starting from the neighborhood of the umbilicus and terminating in one large trunk on either side which ran up to the axilla. The direction of the blood-current in these veins was from below upward. When the abdomen was opened above the umbilicus, a large quantity of fluid was evacuated and there was some adhesion between the liver and omentum and between the omentum and the abdominal wall. The liver was firm, finely granular on the surface, and of about normal size. The spleen was enlarged to at least double its normal size. The operator fixed the omentum across the abdominal wall by catgut sutures, and thoroughly rubbed with dry sponges the surface of the visceral peritoneum. A drainage-tube was then inserted into the pelvis through a wound above the pubes. The upper incision was entirely closed. The patient made an operative recovery and fluid was frequently withdrawn through the tube, so as to prevent soiling of the dressing. The amount withdrawn through the tube gradually decreased until October 10, when the tube was removed. At the time of operation the abdomen was 34½ inches in circumference; at the time the tube was withdrawn it measured 24 inches. Three weeks after the patient left the Infirmary the abdomen again

¹ Austral. Med. Gaz., June 20, 1904.

² Ann. of Surg., Sept., 1903.

became distended with fluid and 230 ounces were withdrawn. From this date there was no further accumulation of fluid, and in February, 1903, the patient was perfectly well, fat, and strong. There was no evidence of fluid in the abdomen. The veins in the abdominal wall were very large. The liver could be felt adhering to the abdominal wall. On the right side the superficial epigastric vein developed into a large trunk, through which a vigorous circulation was carried on between the groin below and the axilla above, the blood-current running in the upward direction. Although Talma first suggested operating for this condition, Morison and Drummond also devised the operation and practised it without knowledge of Talma's suggestion, and Morison was the first to operate successfully upon such a case.

A case of **successful epiploexy** is recorded by Barnham¹ (Baltimore). The patient was a woman 56 years of age, and at the time of operation her abdomen was enormously distended, her limbs were edematous, and her skin was of a muddy yellowish color. The abdomen had never been tapped. It was opened, the omentum was found partially adherent to the abdominal wall, and the liver was about one-half the natural size. About 6½ gallons of fluid were removed and the omentum attached to the abdominal wall. For 6 months after the operation the patient was better than she had been for years, and was actively engaged in her household duties. At this time, however, she began to complain of slight pain in the left thorax and of shortness of breath. A pleural effusion developed and was relieved by tapping. At this time, however, there was no recurrence of the ascites, which Barnham takes as an indication of cure, since it is most likely that with the occurrence of the pleuritic effusion a recurrence of the ascites would take place.

Sinclair White² reports 2 cases of **ascites secondary to alcoholic hepatitis in women treated successfully by epiploexy**. The disease in both of these patients was very far advanced. One year has elapsed since the operation in both cases, and the patients are in good condition, with no return of the ascites. The following are White's conclusions regarding operations for this condition: "1. There is indisputable evidence that cirrhosis of the liver, accompanied by ascites, is not always a hopeless disease. 2. The ascites can be permanently cured in a considerable percentage of cases by operation. 3. There is reason for thinking that the operation of epiploorrhaphy may not only cure the ascites, but also lead to partial degeneration of the damaged liver-cells. 4. Tapping alone has occasionally cured ascites, and should be tried once, or oftener, before proceeding with the more serious operation. 5. The operation of epiploorrhaphy is a formidable one, and should be undertaken only in selected cases. 6. The divergent opinions respecting the significance of ascites in cirrhosis of the liver are best explained by assuming that the disease has more than one type, and that while in one class of cases, owing to the damage sustained by the hepatic cells, the patient is hopelessly incurable by the time ascites has appeared, in a second and probably more numerous class, the incidence of the poison has fallen more especially

¹ Med. News, Mar. 5, 1904.

² Brit. Med. Jour., Oct. 10, 1903.

on the hepatic connective tissue, leading to injurious pressure on the portal venous system and peritoneal effusion before the liver-cells have become seriously damaged."

Koslowski¹ discusses **epiploexy and its results**. The operation is perfectly rational in hepatic cirrhosis. Experience has shown, however, that in order to be successful the operation must be performed in the earlier stages of cirrhosis, before the liver-cells have lost their functions beyond restoration. Hence we must operate during the hypertrophic stage of cirrhosis. Advanced hepatic atrophy is a contraindication. So are general debility, cardiac disease, renal involvement, and icterus. The various methods of attacking the omentum do not seem to influence the outcome. The operation is not more difficult or dangerous than exploratory laparotomy. From a series of 168 cases Koslowski finds the percentage of favorable results (cures and improvements) to be 46, that of unfavorable results, 49 (4 % unknown). The most encouraging outcome was seen in early operations, when we can expect 50 % of successful cases. The operation removes the ascites, while its effect on the process of the liver is not as yet definitely known.

M. L. Harris² discusses **Talma's operation in cirrhosis of the liver**. Previously he has reported 2 cases. He now adds 4 others. Of the 6 patients, 5 were dead inside of a month after operation and 1 was alive, but without improvement, 5 months after operation. The 5 patients who died were undoubted cases of alcoholic cirrhosis; the 1 that was living at the end of 5 months was in all probability due to syphilis. All of them were far advanced when operation was undertaken. In 2 of the cases, in addition to fixing the omentum, the gallbladder was drained for the purpose of relieving the cholemic symptoms. Harris concludes that the benefits to be derived from Talma's operation in alcoholic cirrhosis, even under favorable conditions, are but temporary. (In 105 cases collected by Greenough, but 9 showed improvement after 2 years.) In order to obtain the full benefit of the operation, it should be performed early—at the first appearance of ascites or even to anticipate the ascites, if possible.

Fixation of both the omentum and the spleen for certain diseases of the liver and spleen is recommended by Schiassi.³ The liver being the recipient of toxins derived from both the spleen and the intestine, Schiassi proposes to sidetrack these toxins by throwing them into the general circulation. Of course, a large amount of blood is in this manner also prevented from passing through the liver. The operation is especially recommended in nonalcoholic cirrhosis of the liver, particularly if the cirrhosis is of splenic origin. The operation consists in the fixation of both the omentum and the spleen in the wound of the abdominal wall. A point is selected on the left side, just below the costal border, on a line with the middle of the clavicle, and from this point 2 incisions were made, one vertical and the other transverse. The triangular flap, consisting of all the structures down to the peritoneum,

¹ Roussky Vrach, Feb. 21, 1904; Amer. Med., Apr. 23, 1904.

² Jour. Am. Med. Assoc., Oct. 31, 1903.

³ Bull. de l'Sci. Med., Oct., 1903.

inclosed between these incisions, is then reflected. The peritoneum is opened along the transverse incision, and the omentum brought out and sutured between the peritoneum and the flap. A vertical incision is then made in the peritoneum, along the vertical incision in the abdominal wall, and the spleen withdrawn and fastened in this wound. The spleen cannot usually be placed between the peritoneum and the abdominal wall, as in these cases it is generally greatly enlarged. Schiassi asserts that the operation is very well borne by the patient, so that it is not necessary to divide it into 2 stages. It is strongly recommended in Banti's disease and in material splenomegaly with hepatic cirrhosis. Fixation of the spleen alone is suggested for splenic anemia in adults and in children, for cases of Banti's disease before ascites has developed, and for the splenomegalic cirrhosis of Popoff-Gilbert.

C. B. Lockwood¹ reports a case of **hepatectomy for the removal of Riedel's lobe**. He first discusses the anatomy of this condition and describes the various forms of Riedel's lobe. The case described is that of a young woman who complained of constant abdominal pain situated in the right iliac region. A tumor could be felt just outside the middle third of the right linea semilunaris. The tumor moved with respiration, was smooth and painless. It could be pushed back in much the same way as a displaced and movable kidney may, and this was supposed to be the true condition. The pain, however, was so definitely located over the appendix that this organ was removed but found to be normal. The patient continued to complain of pain in the right side, and the abdomen was opened with the intention of removing the mass which had been felt and which was now known to be a projection from the liver. The tumor was easily withdrawn and was removed by a V-shaped incision. The wound in the liver was closed with sutures and the patient recovered. After the operation the patient remained well and free from pain.

Ransohoff² (Cincinnati) reports a case of **hepatectomy for tuberculoma of the liver**. The literature relating to resection of the liver for growths is freely discussed, but he has been unable to discover a report of the case of resection of the liver for solitary tuberculoma. The patient was a man 36 years of age. He had never had lues. He had been married for 6 years and had 1 child, who was healthy. Examination showed a mass connected with the left lobe of the liver, which was thought by Ransohoff and 2 consultants to be a carcinoma. When the abdomen was opened, the tumor was found to be embedded in the left lobe of the liver. There was no inflammation of the neighboring organs, nor were there any enlarged lymph-nodes in the omentums. The mass was freely movable and was hard and nodular. It was still thought to be malignant, and Ransohoff determined to resect it. With this object the mass was brought into the abdominal wound and fixed by 2 blunt-pointed bullet-probes passed at right angles to each other, and under these was placed an elastic constrictor. The next day the patient had a profuse hemorrhage, which was due to the cutting of the

¹ Lancet, July 25, 1903.

² Med. News, Apr. 16, 1904.

elastic ligature and which ceased when it was removed. At this time the growth was removed by a V-shaped incision with the thermocautery. For 48 hours the patient did well, but then he began to vomit blood and died on the sixth day, without the development of any evidences of a peritonitis. It is thought that the death was the result of necrosis of the gastric mucosa from retrograde thrombosis. The growth was examined by Hiller and a diagnosis of solitary tubercle made, although the tubercle bacilli could not be demonstrated in the specially stained sections. The difficulty which the pathologist had in making the diagnosis indicates somewhat the difficulty which would confront the operator. The various methods of resecting the liver are briefly discussed.

H. A. Haubold¹ describes a **successful excision of a gumma from the anterior portion of the liver**. The patient was a married woman 21 years of age, in whom it was impossible, after careful inquiry, to obtain the slightest evidence of specific disease. The mass could be easily felt through the abdominal wall and was thought to be a neoplasm of the liver. When exposed through an incision, this idea seemed to be confirmed, and the mass was enucleated with little difficulty and without profuse hemorrhage. The growth involved the portion of the liver upon which the gallbladder rested, and after its removal it was thought wise also to remove the gallbladder. This was done, and the wound was drained. Excepting for infection of the wound, the patient made a satisfactory recovery. The mass removed was supposed to be a sarcoma, but careful and repeated microscopic examinations showed it to be a gumma. The literature of the removal of liver growths, and especially gumma, is discussed.

Tuffier² reports a case of **cancer of the liver which closely simulated a movable kidney**. Operation was undertaken for a supposed movable kidney. There was a movable tumor which seemed to present all the signs met with in a case of movable kidney. When the abdomen was opened, a tumor was seen to be attached to the liver by a pedicle. The growth was removed without difficulty and was found to be an epithelioma, which is thought to have originated in an aberrant lobe.

A lengthy discussion of the **surgery of the biliary passages** is presented by Salvatore Salinari,³ who refers to a great number of articles dealing with this subject. For calculi in the hepatic duct digital fragmentation is recommended. Care must be taken, however, that the fingers pass behind the stone, so that it is not pushed back toward the liver. Salinari shows a great preference for the operation of cholecystenterostomy. It is recommended for cicatricial obliteration of the common duct, although sometimes a resection and anastomosis of the duct can be accomplished. In making a cholecystenterostomy the gallbladder should be attached to the duodenum and never to the colon. A recurrence of gallstones after a thorough operation is very rare, con-

¹ Ann. of Surg., Feb., 1904.

² Rev. de Gyn. et de Chir. Abd., Sept.-Oct., 1903.

³ Bull. de l'Sci. Med., Sept., Oct., Nov., 1903.

sequently there is no reason for removing the gallbladder as a routine practice. To avoid the possibility, however, of a recurrence of gallstones, a prolonged course of prophylaxis is recommended. In operating for cancer of the gallbladder the whole organ should be removed, and if a portion of the liver is involved, a resection of the diseased portion should be made. The removal of the neighboring lymph-glands has been seldom undertaken. Although it might be possible to resect a cancer of the common duct and make an anastomosis, usually the best plan of procedure would be to tie both ends of the duct and make a cholecystenterostomy. Unfortunately, the growth usually involves the duodenal extremity of the duct and cannot be completely removed. The various operations for cancer of the ducts are not heartily recommended, as they can do nothing but prolong the life for a short time. For acute infections of the biliary passages Salinari prefers simple cholecystostomy. If the removal of the gallbladder seems necessary, it should be performed after the subsidence of acute symptoms. He states that the best treatment for a wound of the gallbladder is the removal of the organ. If the cystic duct is wounded, it should be tied and the gallbladder removed. Drainage is the only possible treatment for injury of the hepatic duct. In injuries of the common duct a safe procedure is to tie the two extremities and perform a cholecystenterostomy.

Binnie¹ (Kansas City) deals with the **surgery of the upper right quadrant of the belly**. He endeavors to impress upon the general practitioner that gallstones and empyema of the gallbladder are not the only affections in this region which are open to surgical relief, and that cholelithiasis gives rise in many cases to grave complications which are difficult to diagnose, but which are also susceptible of great improvement or cure by early surgical intervention. Among other points discussed Binnie describes the symptoms of cholangitis, which vary so much in different cases. In some cases the symptoms are almost identical with those of malaria, but may be differentiated from this condition by the fact that malarial organisms are not found in the blood and quinin has no effect.

Piraire² reports a case in which, **after performing cholecystectomy, he attached the cystic duct in the abdominal wound for the purpose of drainage**. The patient was a woman 61 years of age. The gallbladder contained a quantity of bile and a portion of its mucous surface was rough, due to the presence of small stones in the wall of the gallbladder. There was but one small stone free in the cavity. The cystic and common ducts together contained 27 stones. The patient made a satisfactory recovery. A number of small stones were removed from the wall of the gallbladder after it had been taken out. Piraire believes that this is the first time this operation, which he terms cysticostomy, has been performed. The stones in the wall of the gallbladder in this case are believed to be pure parietal calculi. The literature of the subject is freely discussed.

¹ Amer. Med., Oct. 3, 1903.

² Rev. de Chir., July 10, 1903.

After a discussion of **hepatic drainage** E. Berger¹ draws the following conclusions: "1. Drainage is preferred to choledochotomy closed with sutures because it hastens cure of the existing cholangitis, and the operation is done more rapidly. 2. Drainage is indicated in cholangitis when it is not possible to remove all the stones from the common and hepatic ducts at the time of the operation. 3. It is the safest and best method even in cases in which the histologic and operative findings show no stones in the deep gall-passages. 4. It is contraindicated in acute choledochus obstruction (where one should really not operate at all) and in acute suppurative cholangitis, because there is danger of infection spreading downward. 5. The incision is best made at the supraduodenal portion of the choledoch duct; encysted concretions necessitate special incision for their removal. 6. Since in hepatic drainage stones escape in about 17 % of all cases after operation, it prevents subsequent operations. Recurrence of gallstones is the exception when drainage has been carried out. 7. With drainage diffuse cholangitis subsides even when stones still exist high up in the liver. 8. With hepatic drainage the mortality does not exceed 2 % or 3 %. 9. Cholangitis in the larger branches of the hepatic duct, long-continued icterus, and cholemia, liver cirrhosis, pancreas affections, enterobiliary fistulas, and extensive adhesions increase the dangers. 10. In diffuse cholangitis, carcinoma of the pancreas or gall-passages, and liver abscess, the mortality is nearly 100 %. This is not due to operation, but to prolonged internal cure. If in choledoch duct obstruction 3 months at Carlsbad fail to give relief, he says an operation is necessary."

Kehr² describes an operation which he calls **hepatocholangioenterostomy**. This operation was suggested by Baudouin and Langenbeck, and consists in the establishment of direct communication between the parenchyma of the liver and the intestinal canal. Kehr performed this operation in a case of cicatricial stenosis of the common bile-duct. An incision about 6 cm. in length was made in the duodenum, and the edges of the bowel were sutured to the margins of a deep wound made in the lower edge of the liver. In most instances obstruction of the common duct can be satisfactorily and better handled by other means, and therefore the indications for this operation are rare. If the obstruction is a result of inflammatory exudates, the operation may prevent a fatal cholemia. In the case reported there was no disturbance of the liver tissue as a result of the direct contact with the intestinal contents. Any change resulting from this contact, however, could be shown only by a postmortem examination.

Francis T. Stewart³ (Philadelphia) reports an interesting case of **primary typhoidal cholecystitis with calculi**. That the typhoid bacillus may cause a suppurative inflammation of the gallbladder in a patient who has never had typhoid fever has only recently been demonstrated. Burley has reported a table of 7 cases which he has collected from literature. Stewart's case is that of a woman, 26 years of age,

¹ Arch. f. klin. Chir., 1903, Bd. lxxix, Heft 142; Amer. Med., Mar. 12, 1904.

² Zent. f. Chir., 1904, No. 7.

³ Amer. Med., June 25, 1904.

who gave a very clear history of gallstones. At the time of operation she had been jaundiced for 3 weeks, but her blood coagulated in one minute. The patient has never had typhoid or any disease resembling it. The gallbladder was elongated, thickened, and in a sac near the cystic duct was a stone $\frac{3}{4}$ of an inch in diameter. The gallbladder was drained, and the patient made a good recovery. Longcope made cultures from the pus and grew a pure culture of the typhoid bacillus. After this report was received a positive Widal reaction was also obtained.

Thomas and Schölberg¹ (Cardiff) report a case of **postenteric infection of the bile-channels for which cholecystotomy was performed**. The attack of cholecystitis came on about 2 months after the fever. After drainage of the gallbladder the patient made a good recovery. The typhoid bacillus and also *Bacillus coli communis* were demonstrated in the pus.

A. T. Cabot² (Boston) reports 2 cases in which **acute flexion of the gallbladder produced attacks of biliary colic**. Although Fenger describes attacks of colic and jaundice which he believed to be due to a bending or kinking of the ducts and suggested that a valvular condition might be brought about by an oblique insertion of the common duct into the duodenum, which would produce colic, he made no reference to a bending of the gallbladder itself. In Cabot's first case the gallbladder was rather long, its fundus extended below the edge of the liver, and the pressure of the ribs, which curved sharply inward and reached much nearer the umbilicus than usual, carried this fundus downward and inward, producing a distinct bend or kink in the middle of the gallbladder. Cholecystostomy was done in this case and the patient was greatly improved by the operation. She was not altogether relieved, however, of the abdominal discomfort until the appendix was removed 3 years later. After the operation on the gallbladder, however, she suffered no more attacks of hepatic colic. In the second case, that of a man who had suffered from frequent attacks of hepatic colic, the gallbladder was found long, rather lax, and projecting beyond the edge of the liver. In this case also there was a distinct bend about the middle of the gallbladder; cholecystectomy was performed, and the patient absolutely relieved of all symptoms. In neither of these cases was there any other lesion to account for the colic.

Graham³ (Indianapolis) describes a method of **drainage in cholecystostomy** which was devised by George J. Cook and which he has found most satisfactory. The method is as follows: "The drainage-tube employed should be of large caliber and possess firm walls, so as not easily to be compressed. Its proximal end is firmly fixed in the gallbladder by a purse-string suture. Its distal end should not project more than $1\frac{1}{2}$ to 2 inches beyond the edges of the wound. To this end is firmly tied an extra large and extra thick condom or rubber sac. The gauze dressings are next applied; upon these is placed the condom or

¹ Lancet, Feb. 27, 1904.

² Boston M. and S. Jour., Dec. 21, 1903.

³ Amer. Med., Aug. 1, 1903.

rubber sac, and this is well surrounded and covered with cotton. All are retained in position by a binder-bandage snugly adjusted. It is then seen that by this method is produced an artificial gallbladder, and it lies in close proximity to the gallbladder which is to be drained. This so-called artificial gallbladder is removed once or twice every 24 hours, emptied, and thoroughly cleansed, after which it is again placed in position."

Elsberg¹ (New York) deals with some clinical features of disease of the gallbladder and bile-ducts due to gallstones, and the indications for their surgical treatment. His conclusions are as follows: "*Operative interference is indicated in—*(1) Acute inflammatory diseases of the gallbladder with signs of severe infection or peritoneal invasion. (2) Cases with very frequent mild attacks, which incapacitate the patient from work, which are accompanied by much loss of flesh and strength, or in which the patient is in danger of acquiring the morphin habit. (3) Persistent biliary fistula. (4) Rare cases in which the symptoms are due to adhesions of the normal gallbladder to neighboring organs. (5) Chronic obstruction of the common bile-duct. It is probable that, in the future, medical men will agree upon more early and more radical treatment of many cases of gallstone disease, and that the removal of the gallbladder—the *fons et origo* of gallstones in the vast majority of cases—will be done more often. The indications for cholecystectomy will hence be much extended, and operations upon the common bile-duct become of necessity less frequent."

Scudder² (Boston) compares the benefits of cholecystostomy with those of cholecystectomy, taking as a basis for his paper 16 cases, in 7 of which cholecystostomy was performed, and in the remainder, cholecystectomy. Of the 7 cholecystostomies, 1 died of pneumonia; 5 of the remaining 6 cases have been carefully followed since operation, and only 1 case is absolutely well, without pain or discomfort referable to the gallbladder region. In the 9 cholecystectomies all the patients recovered from the operation, and a report has recently been obtained from each of them. The longest time which has elapsed since operation in these cases is 3 years, and the shortest, 1 month. In each instance there has been no recurrence of gallstone colic and no discomfort whatsoever referable to the gallbladder region. Winslow has examined the records of the cholecystectomies and cholecystostomies done at the Massachusetts General Hospital in a period of 10 years, and his statistics correspond with those of Scudder. The latter, after discussing the pros and cons of the two operations, expresses the following opinion: Cholecystostomy should be done in those cases of gallbladder and biliary duct surgery in which quick drainage is needed for the deeper ducts, and in which the surgeon is not absolutely sure that the deeper ducts are entirely free. Cholecystectomy should be done in cases of acute cholecystitis, in cases of cholecystitis resulting in gangrene and empyema of the gallbladder, in small contracted (infected) gallbladders which are functionally useless and which will not be of service in facilitating drainage,

¹ N. Y. Med. Jour., Mar. 26, 1904.

² Boston M. and S. Jour., Feb. 11, 1904.

and in all cases in which the surgeon is morally sure that the deeper ducts are free from obstruction. Brief histories are given of each of his 16 cases.

B. Farquhar Curtis¹ discusses the **surgical treatment of gallstones** and presents the following conclusions: "The advantages of operation performed while the stones still remain in the gallbladder or cystic duct and before grave infection has developed are numerous: (1) The serious accidents of infection are avoided, and any inflammatory condition which may exist can be improved or cured, just as drainage cures urinary cystitis. (2) The stone is removed before it enters the common duct, thereby preventing all the dangerous consequences likely to follow the presence of a stone in that passage. (3) Further attacks of cystitis and colic are prevented. (4) Further calculus formation is prevented or impeded, for the stones are formed in infected gallbladders, and the latter may be removed by operation or rendered so healthy by drainage that no more calculi will form. Kehr² estimates the recurrence of stone, adhesions, and other complications after operation in his cases at 10 %. Schott³ gives the final result of 180 cases from Czerny's clinic, followed for 5 or 6 years after operation, and including serious conditions requiring choledochotomy, cholecystenterostomy, etc., and finds that only 5 % had symptoms referable to the biliary system. Not a single case had another gallstone form after operation. (5) It must be remembered, also, that latent cases are by no means free from danger, so that the individual who has recovered from an attack of colic cannot be considered cured, even if he is entirely free from symptoms for years, as it is probable that stones remain behind, or that some chronic cholecystitis persists. The possibility of secondary pancreatitis must be kept in mind, and also that of cancer of the gallbladder, which is more common than has been supposed. Riedel states that he has observed in his practice over 50 cases of cancer of the gallbladder, and it is to be noted that, while the presence of gallstones is universally accepted as the principal cause of the disease, the stones have generally existed without previous symptoms, the first sign of trouble being given by the tumor of the gallbladder itself. (6) Without reference to more important results, it is the general feeling of those with experience in the surgery of cholelithiasis that in the latent cases, while the patients do not present symptoms pointing directly to the biliary system, they are afflicted with various dyspeptic complaints, and that the latter can be relieved or permanently cured by operation."

Wm. J. Mayo⁴ presents some **observations on the surgery of the common bile-duct**. He begins by saying that it is a fascinating theory, and while not proved, can be said to be altogether probable that the gallbladder is infected through the bile in the large majority of cases, and not by way of the common duct and duodenum. The latter route of bacterial invasion takes place undoubtedly, especially in the more

¹ N. Y. Med. Jour., Jan. 2, 1904; Buffalo Med. Jour., Feb., 1904.

² Münch. med. Woch., 1902, Nos. 41, 42, and 43.

³ Beit. z. klin. Chir., 1903, xxxix, S. 427.

⁴ Med. Rec., Apr. 30, 1904.

serious grades of infection and often when no stones are present. In 90 % of the cases of common-duct disease the infection comes from the bile and gallbladder. It is important, therefore, to recognize the gallbladder in the etiology of these infections. When the infection has confined itself to the gallbladder, the organ is distended with impacted stones, and, above all, has an obstructed cystic duct. Such an organ is functionless and should be removed, since as long as it remains it is a possible source of future troubles, such as reinfection, mucous fistula, attacks of colic, and cancer. Not all these cystic gallbladders, however, require removal, since a large stone may block the duct without injury to it. Mayo recommends the removal of the gallbladder from below upward, first ligating the cystic duct and vessels. The result is that there is much less bleeding than when the removal is made from above downward. In many cases in which drainage is indicated in addition to cholecystectomy the fundus and a portion of the gallbladder may be removed, the remaining portion deprived of its mucous membrane, and a drainage-tube attached to it. This plan may also be pursued if it is found impossible to remove the wall of the gallbladder because of adhesions. Although many surgeons recommend the removal of the gallbladder in every case, and Mayo states that he performs this operation much more frequently than he did formerly, yet in simple cases of stones with latent infection, with the gallbladder in good condition, cholecystostomy will give good results. In many cases the saving of life depends upon the thorough drainage of the main ducts. Drainage through the open cystic duct, however, amounts to the same thing, and in most instances is sufficient. In all cases even without symptoms of stone in the ducts a careful examination should be made. When a stone is found in the common duct, it should be held between the left forefinger and thumb and two mattress sutures introduced on each side of it. The duct is then split, the stone removed, and the sutures united across the opening. Close approximation is not made, for it would hinder drainage. In septic cases a tube is cut fish-tailed and introduced into the dilated duct, being secured by the catgut suture which has already been introduced. The finger is the only reliable guide in detecting stones in the common duct, location by probes and scoops being indefinite. In all cases in which the duct is dilated and jaundice is present, if no cause for the condition can be detected, the duct should be opened and thoroughly explored. The cystic artery is often wounded, and it is usually supposed that the hemorrhage comes from the hepatic artery, but the latter vessel is not observed during a well-conducted operation for common-duct stones. Occasionally no stone can be felt, and yet, from the symptoms, the operator is certain that they are in the common duct. Frequently in these cases the parts are adherent and so disturbed as to be unrecognizable. To find and open the common duct in such cases the gallbladder should be split from top to bottom and the incision extended down the entire length of the cystic duct. Mayo states that although it is possible that duct stones may arise primarily, he has not observed such a case, and believes that when flat, disk-shaped

stones originating in the hepatic ducts are encountered, they are the result of obstruction of the common duct by a stone which has made its way from the gallbladder. He recommends strongly the complete removal of all stones at one sitting if the patient can bear the operation. In performing cholecystenterostomy the duodenum is preferred, but in 5 cases it was found impossible to use this portion of the bowel, and the anastomosis was made with the transverse colon; although, theoretically, this seems a dangerous practice, the result in each case was just as satisfactory as in those in which the duodenum was used. Mayo appends to his paper a table of 107 operations upon the common duct which occurred in 728 operations upon the gallbladder and bile-passages performed by himself and Charles H. Mayo.

Padula,¹ in a discussion of the **surgical anatomy of the ductus choledochus**, pays particular attention to the caliber of the bile-ducts. Information on this subject is lacking in most works on anatomy. The common duct is divided into 3 portions by Padula, the first of which runs in the epiploön upon the border of the foramen of Winslow, beginning at the hepatic duct and extending to the duodenum. This portion is called the epiploic or supraduodenal portion. The second or retroduodenal portion is that which lies between the duodenum and the head of the pancreas. This portion sometimes occupies a groove in the pancreas or passes through the gland itself. The third and last portion is that which lies in the wall of the duodenum. The first portion is a little larger than the hepatic duct, but it gradually diminishes until the second part is as narrow or narrower than the hepatic duct. The third portion corresponds in size to the cystic duct or may be narrower. When distended on the cadaver, the first portion attains a diameter of from 7 mm. to 8 mm.; the second portion, a diameter of 5 mm.; and the last portion, a diameter of $3\frac{1}{2}$ mm. Padula states that the arrest of calculi in the common duct may be attributed to 3 causes: (1) Spasm of the sphincter of Oddi; (2) the calculus catching in a depression of the mucosa of the choledochus; (3) a reduction of the normal diameter of the duct.

Berg² describes a method of **retroduodenal choledochotomy** which he has been able to perform repeatedly, with satisfaction, upon the cadaver. It consists in making a straight incision through the parietal peritoneum on the right side of the duodenum. This allows the duodenum to be moved sufficiently to the left side thoroughly to expose to view the common duct where it enters the bowel. This operation is especially recommended for stones lodged in the retroduodenal portion of the common duct, and is supposed to be much more safe and satisfactory than the method of McBurney, which consists in the removal of the stones through the duodenum.

Geo. E. Brewer³ reports 3 cases of **common-duct stone associated with acute septic cholangitis**. Although jaundice and pain are the commonest and often the only symptoms of stone in the common duct,

¹ Ann. d. Med. Navale, Nov., 1903.

² Zent. f. Chir., 1903, No. 27.

³ Med. Rec., Feb. 20, 1904.

in a small number of cases there are, in addition, chills, fever, and sweats so characteristically intermittent as strongly to suggest malaria. It has been said that these febrile crises were due to bile-absorption, while others regard them as of nervous origin and similar in character to some of the varieties of urethral fever. Most modern observers, however, consider the condition as one of septic absorption from infection of the duct—a true infectious cholangitis. In many instances a diagnosis of malaria with catarrhal jaundice is made and valuable time lost. The only treatment for these cases is removal of the stones and hepatic drainage. In each of Brewer's cases the patient made a satisfactory recovery after the removal of the stones and the establishment of thorough drainage. In the first 2 cases the acute symptoms had existed for several weeks and the progress of the septic intoxication was gradual. In the third case the symptoms were grave and alarming from the first, and the progress of the sepsis was rapid. In the milder cases without gross changes in the bile or bile-ducts it is probable that the organism is one of low virulence, and that the lesion is limited to the larger ducts. In the severer type of the disease the patients die quickly unless relieved at an early period, and the autopsies reveal a septic and often virulent cholangitis, with edema of the liver and innumerable small abscesses.

Brewer¹ also reports a case of **common-duct stone without characteristic symptoms**. In this patient, a woman 22 years of age, there were present symptoms indicating gallstones, but not a single symptom of stone in the common duct. She was able at the time of operation to work without interruption. She applied for treatment because of more or less discomfort in the upper right quadrant of the abdomen. When exposed, the gallbladder was found to be normal and free from calculi, as was the cystic duct. A hard, movable stone, however, was found in the common duct, and was removed through an incision in its wall. The patient made a good recovery.

The **surgery of the pancreas**, with a special consideration of **trauma and inflammatory processes**, is dealt with by von Mikulicz.² He speaks first of the difficulty of diagnosing and treating diseases of this organ because of its situation. Most cases must be operated upon when the diagnosis is only probable, as it is only after the abdominal cavity has been opened that an absolute diagnosis can be made. To rely upon functional disturbance as a diagnostic sign is a mistake, since when this develops the greater portion of the gland is affected. When once a pancreatic diabetes or symptoms of severe disturbance of its fat-digesting function have developed, the patient is, as a rule, beyond the help of operative measures. The greatest stress is laid by von Mikulicz upon the danger of hemorrhage and that arising from the special secretion of the gland leaking from the injured parenchyma in larger or smaller quantities. The hemorrhage can be controlled only by deep sutures and ligatures including a quantity of tissue, and the leakage is best avoided by gauze drainage. The pancreatic juice mixed with

¹ Med. Rec., Jan. 23, 1904.

² Ann. of Surg., July, 1903.

blood has a very toxic effect, and can, in the so-called apoplexy of the pancreas, result fatally without the complication of bacterial infection. When the latter element is added, however, the danger is greatly increased. Therefore in whatever operation, whether for injury or for disease of the pancreas, the greatest pains should be taken to keep the secretion of the injured or diseased gland from getting into the abdominal cavity, and unless, after dealing with the injury or disease, this danger can absolutely be avoided by closure of the injured or diseased area, gauze drainage is most essential. Von Mikulicz fortifies this point by very convincing statistics. Even when the pancreatic wound has been sewed, tamponade is recommended. The diagnosis of pancreatic injury is frequently not made even after the abdomen is opened, because of the association of injuries of the stomach and intestine; therefore it should be an invariable rule of the surgeon to examine the pancreas carefully in all injuries to the organs in its neighborhood. Injuries of the pancreas are frequently found at autopsy which have been overlooked at the time of operation upon the stomach and intestine, and this oversight has been the cause of death. In operations upon the pancreas von Mikulicz is a strong advocate of thoroughly washing out the peritoneal cavity with warm normal salt-solution. In a collection of 45 cases of pancreatic injury there were 21 penetrating wounds and 24 subcutaneous wounds. Of the 21 penetrating wounds, 12 were of gunshot origin and 9 were stab wounds. Of the gunshot wounds, 5 were operated upon, 2 dying and 3 recovering. Of the 24 subcutaneous injuries, 13 were not operated upon and all died. Of the 11 operated upon, 7 recovered. Three cases were operated upon early—within 4 days after the injury. One of these recovered and 2 died. It must not be supposed that every injury of the pancreas justifies a bad diagnosis or warrants an immediate recourse to operation. The general condition of the patient and the severity of the symptoms must guide the surgeon in each individual case. The suspicion of severe injury to the pancreas should encourage the surgeon to act quickly. In considering the inflammatory diseases of the pancreas a preference is shown for Robson's classification of acute, subacute, and chronic pancreatitis. Without doubt bacterial infection in acute pancreatitis plays an important role, but it does not alone explain the singularly severe symptoms. Sharp differentiation between pancreatic apoplexy and acute hemorrhagic pancreatitis can be based only upon bacteriologic examination—the one is an aseptic, the other a septic, process. In considering the etiology of acute pancreatitis the following points are accentuated: The very slight tendency of pancreatic hemorrhage to stop spontaneously. The locally destructive and the general toxic action of the pancreatic ferments set free by the inflammatory and hemorrhagic processes, and, finally, the ease with which the pancreas may be infected from the ductus choledochus.

Acute pancreatitis may be considered an acute phlegmon which, on account of the peculiar nature of the tissue, runs an unusually severe course. The only radical therapy is to open the focus of infection and

drain it. Gauze tampons in these cases will best combat the fatal tendency to hemorrhage. The pancreas is one of the most unfavorable places for the development of such a condition. Operation in the acute stage is a much-mooted question. Von Mikulicz tends rather to surgical interference. It is true that the results of late operations have been better than those of early operation, but there are no statistics at hand to show how many cases of acute pancreatitis which are not operated upon die before reaching the stage for late operation. Operation in these cases is usually done after a diagnosis is made of perforative peritonitis or intestinal obstruction. Nimier has proposed incising the pancreas in acute pancreatitis and introducing a tampon, and at the close of his paper von Mikulicz inserts the history of a case operated upon at the Massachusetts General Hospital by C. A. Porter, in which this treatment was successfully carried out. Reference is made to reports of cases in which simple abdominal section with drainage of the exudate in the general cavity had proved successful. Notwithstanding this fact the surgeon should not be content to rest here, but should expose the pancreas, if the patient's condition will permit, and drain it. Von Mikulicz has collected 75 operations for acute pancreatitis which were performed in the early as well as the late stages of the disease. Of 37 cases in which the pancreas was involved in the operative interference, 25 recovered; in 41, where the pancreas was not touched, 4 cases recovered.

In the subacute cases of pancreatitis the surgeon has time to observe the case more carefully and to consider the advisability of combating the attack without surgical interference. In these cases delay is not inopportune, as the diagnosis is still more uncertain than in an acute pancreatitis. In the last 2 years 2 views have been demonstrated: first, that chronic pancreatitis runs a course not dissimilar to that of pancreatic carcinoma, and has often been mistaken for the latter, and, second, that active interference has often been postponed because we have been unable, as just stated, properly to recognize the condition of chronic pancreatitis, and have confounded it with a condition beyond surgical relief. Even after opening the abdomen a differential diagnosis is often difficult. The association of chronic pancreatitis and diseases of the biliary tract has been frequently pointed out by Korte, Robson, and Opie. It must be remembered that it is possible for chronic alcoholism to produce a pancreatitis analogous to the development of cirrhosis of the liver from the same cause. Pancreatic stone does not give rise to any characteristic symptoms, but is frequently the cause of secondary changes in the gland itself producing a chronic or subacute pancreatitis.

B. G. A. Moynihan¹ discusses the **present position of our knowledge of diseases of the pancreas**, dividing the subject into experimental work on the pancreas, signs and symptoms of pancreatic disease, cysts of the pancreas, calculus, and the various forms of pancreatitis. Under the first head it is stated that total extirpation of the pancreas produces, in addition to certain digestive disturbances, all the

¹ Practitioner, Aug., 1904.

symptoms of diabetes. Partial extirpation of the pancreas never results in permanent diabetes. Ligation of the duct of the pancreas gives rise to chronic interstitial pancreatitis. Subacute transplantation of the tail of the pancreas into the abdominal wall in dogs does not cause diabetes so long as the graft remains active, even though the intraabdominal portion of the organ is later removed. If the graft is then removed, diabetes results promptly. Moynihan then discusses extensively the experimental work which has been done in regard to the etiology of diabetes. The special signs and symptoms of pancreatic disease are enumerated as follows: hemorrhage, fat-necrosis, altered character of the stools, alteration in the constituents of the urine, and wasting. These, of course, are in addition to the glycosuria. Pancreatic cysts are divided into the following: retention cysts, proliferation cysts (cystic adenoma, cystic epithelioma), hydatid disease, congenital cystic disease, hemorrhagic cysts, and pseudocysts. Pathologically, the last should not be included, but clinically their differentiation from the other forms is so difficult that they deserve consideration. Retention cysts result from blockage of the duct due to the impaction of the calculus or calculi, cicatricial stenosis, pressure upon the duct from without, and dislocation of a part of the gland. Proliferation cysts may be either simple or malignant, and their differentiation is frequently quite difficult. Hydatid cysts of the pancreas are extremely rare. Congenital cystic disease similar to the congenital cystic disease of the liver and kidneys has been observed on rare occasions. Hemorrhagic cysts may be the result of disease or traumatism. Hagenbach distinguishes between hematoma in which bleeding occurs into preëxisting cysts, and apoplectic cysts resulting from hemorrhage into softened, degenerate gland-substance. Pseudocysts is a term proposed by Körte to describe certain fluid tumors found in more or less close proximity to the pancreas, but not originating in the substance of the gland. The differentiation from the true cysts is not always possible during life. The traumatism which produces such a cyst may also implicate the gland at the same time, so that the pancreatic juice may escape in small quantity into the pseudocyst and make its mimicry of a true cyst so complete that a distinction is impossible. Moynihan thinks that many so-called pancreatic cysts, especially those of traumatic origin, are in reality peripancreatic or pseudocystic effusions into the lesser cavity of the peritoneum. The following conclusions regarding pseudocysts is taken from an article by Jordan Lloyd: 1. That contusions of the upper part of the abdomen may be followed by the development of a tumor in the epigastric, umbilical, and left hypochondriac regions. 2. That such tumors may be due to fluid accumulations in the lesser peritoneal cavity. 3. That when the contents of such tumors are found to have the property of rapidly converting starch into sugar, we may assume that the pancreas has been injured. 4. That many such tumors have been regarded as true "retention cysts of the pancreas," and that this opinion has been formed upon insufficient evidence. 5. That the diagnosis of distention of the lesser peritoneal cavity before operation can usually be made by the characteristic shape

of the swelling. 6. That early median abdominal incision and drainage is the safe and proper treatment. After discussing the symptoms of pancreatic cysts it is stated that evacuation and drainage are, as a rule, the most successful treatment, although a pancreatic fistula may remain for months. After referring to the subject of pancreatic calculi, acute pancreatitis is dealt with. This disease may result in diffuse local or general hemorrhage, in necrosis, or in suppuration. A typical case of acute pancreatitis is depicted in the following: "The patient is generally very stout, there is commonly a history of gallstones, indigestion, or alcohol. He is suddenly seized with pain in the epigastrium; the pain is agonizing and intolerable; collapse follows, and vomiting sets in. The pulse is rapid and thin; the temperature is slightly elevated, but may be irregular. Jaundice occurs frequently. There is no intestinal obstruction, flatus and often feces passing naturally. At the end of 24 hours the epigastrium, which before was tender and rigid, now shows evidence of slight distention, and is more resistant. Cyanosis of the face, abdominal wall, or thighs may be observed. In the most acute cases death occurs in from 3 to 5 days; when suppuration, with or without hemorrhage, occurs, the fatal issue results in from 7 to 10 days. If the life of the patient is prolonged beyond this, the case may be considered as forming a link between the acute and subacute forms." In the treatment of this condition at the onset morphin must be administered to relieve the excessive pain, but until a diagnosis is made, repetition of the drug is not desirable. When an exploratory incision is made, one or more areas of fat-necrosis may confirm the diagnosis. Drainage may be effected through an anterior or better through a posterior incision. Subacute pancreatitis differs from the acute solely in the intensity of the symptoms. Pain and vomiting are the earliest symptoms, and collapse is generally slight or absent. Epigastric tenderness is well marked, and a well-defined swelling slowly appears above the umbilicus. In the majority of these cases pus forms either around the pancreas or in the lesser sac of the peritoneum. The foramen of Winslow becomes closed by the inflammatory process, and the lesser peritoneal sac becomes gradually distended, the pus burrowing in various directions unless it is evacuated. Such cases should be treated preferably by posterior incision, which begins at the tip of the twelfth rib on the left side and passes obliquely forward toward the umbilicus. It may be necessary, however, first to perform an exploratory laparotomy in order to make a diagnosis. It is only within recent years that the importance and frequency of chronic pancreatitis have been recognized. This condition as seen by the surgeon is always secondary, being dependent upon an infection extending from the intestinal canal or from the bile-passages; upon the long-standing irritation of pancreatic stones; or upon the invasion of malignant disease. Certain toxic substances brought by the blood to the gland may set up chronic inflammation. Cholelithiasis is prominent among the causes of this condition. The duodenal end of the pancreas is the one usually involved in this variety of inflammation, the tail being implicated only in the long-standing and severe cases. The

symptoms vary according to the cause of the disease. In some instances the signs of chronic pancreatitis are identical with and indistinguishable from those of cholangitis. A differentiation may sometimes be made by observing that the pain and tenderness, instead of being over the gallbladder, are in the midline chiefly; pain does not radiate around to the right shoulder, but passes around the costal margin to the left. Jaundice comes on quickly, but deepens much in each attack of pain. As a rule, the jaundice in chronic pancreatitis is not absolute; there are variations. In malignant disease jaundice comes on slowly and insidiously, deepens gradually, and is unremitting. In chronic pancreatitis there is a steady loss of flesh and strength, but again the weakness is by no means so swift in onset nor so rapid in course as in malignant disease.

Courvoisier's law that preëxisting jaundice associated with a distended gallbladder is due to cancer of the pancreas has but few exceptions. The only effective and certain treatment of chronic pancreatitis consists in the performance of a cholecystostomy and prolonged drainage of the bile-ducts. Cholecystenterostomy does not give the same satisfactory results that external drainage of the gallbladder does.

Deaver and Müller¹ discuss the **pathology and surgical treatment of pancreatic diseases**. Acute pancreatitis is said to be essentially a peritonitis of the upper abdomen, with varying lesions in the gland itself, and often the diffused fat-necrosis, which may extend to the fat in the epiploic appendages of the sigmoid on the left, or to the meso-appendix on the right. Acute hemorrhagic pancreatitis is an affection peculiar to the pancreas, and undoubtedly due to the complexity of the ferments and to the internal secretion. Blockage of the ampulla of Vater by a gallstone will produce this condition very promptly. The onset of acute hemorrhagic pancreatitis is rapidly followed by a distention of a part or the whole of the parenchyma of the gland. The bleeding is at first confined to the interlobular and connective tissues, and gradually increases until large areas or even the entire gland is implicated. Gangrenous pancreatitis is the termination of the acute lesion. Suppurative pancreatitis or abscess of the pancreas is due to infection of the gland by bacteria which ascend from the duodenum or are carried through the circulation. The latest investigations—those of Wells—state that fat-necrosis occurs through the lymphatic system. Chronic pancreatitis is of great importance to-day by reason of the excellent results which surgery offers for the cure of this disease, long believed to be incurable and frequently confused in diagnosis with malignant disease. Pancreatic calculi have rarely been diagnosed during life. Stagnation of the secretion alone cannot be held responsible for the formation of pancreatic calculi. The latter portion of the authors' paper deals with the symptoms and treatment of the conditions enumerated. The technic of an operation upon the pancreas varies with the nature of the condition present and the involvement of adjacent tissues. If, on opening the abdomen, fat-necrosis is present, the diagnosis is clear. The gallbladder should

¹ Amer. Med., Mar. 19, 1904.

then be palpated for calculi, and the common duct should always be explored with the finger. The pancreas may be reached through any of the following routes: (1) Through the gastrocolic omentum, below the stomach; (2) through the gastrohepatic omentum, above the stomach; (3) through the transverse mesocolon, back of the colon and stomach. The first route is the most applicable for the purpose of drainage. Mikulicz has formulated the following points, which should be remembered: Drainage of the pancreas is accomplished through free incision, which should be made in the long axis of the gland, extending throughout its entire length when necessary; free drainage should then be established. When the peripancreatic involvement is severe, with necrosis of the gland and fat in the neighborhood of the lesser omentum, loin drainage is required after free incision of the gland. It is useless to attempt to dissect out the necrotic foci. In establishing drainage care must be taken thoroughly to wall off the general peritoneal cavity. If the condition is complicated by the presence of stones in the gallbladder or bile-ducts, a second incision must be made for the purpose of establishing an external biliary fistula. Difficulty is encountered even at the time of operation in differentiating chronic pancreatitis from malignant disease of the pancreas, which shows the necessity of operating even when malignancy appears certain. Drainage of the gallbladder relieves a large majority of the cases of chronic pancreatitis, but often the operation to bring relief is one requiring the removal of gallstones from either the gallbladder or the ducts. Drainage of pancreatic cysts is considered the best treatment.

Bunge¹ discusses the **pathogenesis and therapy of acute hemorrhagic pancreatitis**, reporting a case which recovered after operation. In this case there was extensive fat-necrosis and hemorrhage was diffused in the peripancreatic tissue. The peritoneal cavity was filled with a serosanguineous exudate. This exudate began in the omental bursa, and was followed by fat-necrosis of the gastrocolic ligament and by perforation of that structure. Bunge states that if the anterior wall of the lesser omentum is intact, he cuts it, removes the exudate, and packs the bursa with iodoform gauze; secondary perforation of the posterior wall is guarded against by raising the omentum, colon, and the stomach, and packing that region with gauze. Bunge inclines to the view taken by Hahn, who operates in the early stages of this condition. Bunge says the operation should be done early, before the entrance of bacteria from the intestines complicates the process. If the exudate in the lesser omentum is already infected, and if there is exudate free in the peritoneal cavity, the time for operation is past. He says we are still deficient in diagnosing this condition; it must be made upon the frequent attacks of acute colic and the early vomiting of the small intestinal contents. Acute hemorrhagic pancreatitis differs from peritonitis by a lack of tenderness and rigidity of the abdomen in the first. As to the cause of acute hemorrhagic pancreatitis, Bunge says we know practically nothing. The fat-necrosis is in the majority of instances due to ferment-

¹ Arch. f. klin. Chir., 1903, Bd. lxxi, Heft 3; Amer. Med., Feb. 6, 1904.

tative action of the steapsin of the pancreatic juice upon the neutral fat of the peritoneal cavity.

E. T. Fison¹ reports an interesting case of **acute hemorrhagic pancreatitis**, which also presented a number of other pathologic conditions. The patient was a man, 39 years of age, who was admitted to the hospital for obstruction of the bowels. He had been vomiting incessantly for 4 days. Operation was performed by Luckham. It was thought that the obstruction was probably due to a band of some form of internal hernia high in the intestinal canal. The abdomen was opened above the umbilicus. The abdominal wall before the peritoneum was opened was observed to be dotted with yellow areas of fat-necrosis. When the peritoneum was opened, a quantity of inoffensive brown fluid welled out. Fat-necrosis was very extensive in the great omentum. The pancreas was enlarged, and the tissues about it infiltrated. The organ was exposed, and 3 incisions were made in its substance. The gallbladder was found full of stones. A second opening was made over the organ and the stones removed. The gallbladder was drained, as was also the wound down to the pancreas. The patient was in a bad condition during the operation and died the next day. At the autopsy the diagnosis of acute hemorrhagic pancreatitis was easily confirmed. Fat-necrosis was very extensive. In the appendix a concretion was found, and about 1½ feet from the cecum there was present a **Meckel's diverticulum**. The base of the entire mesocolon was much broadened and filled up by friable, offensive material, and in places pus was found. There were 3 stones in the cystic duct, and a large stone in the ampulla of Vater. Four stones were found in the common bile-duct and 4 more in the hepatic duct. Nothing abnormal was found in the duct of Wirsung. The swollen pancreas measured 11 inches in length and weighed 17 ounces. A complete pathologic report is made of the finding, which confirms also the clinical diagnosis.

The **diagnosis and treatment of acute pancreatitis** is the title of a paper by George Woolsey,² which is based upon 3 cases already reported. (See YEAR-BOOK of Surgery, 1904.) He reaches the following conclusions: "1. In the severe acute cases of pancreatitis the symptom-complex, in connection with some predisposing factor or factors, and perhaps some other early signs, renders it possible to make a probable diagnosis. 2. The diagnosis is easier than in the less acute cases. 3. It is likely to be mistaken only for conditions which also require early operation. 4. The finding of fat-necrosis at the operation confirms the diagnosis. 5. The treatment should consist of early operation, including infusion for collapse, evacuation, and drainage. This may be done under local anesthesia. 6. Extensive or prolonged operations are not justifiable."

Allan³ (Glasgow) discusses the **relation of the pancreas to diabetes, and the question of the transplantation of that gland as a remedy for the disease**. The physiologic experiments, pathologic experience,

¹ Lancet, June 4, 1904.

² Ann. of Surg., Nov., 1903.

³ Lancet, May 14, 1904.

and the results of implanting the thyroid in myxedema all point to transplantation of the pancreas in diabetes as a reasonable and justifiable procedure. Against this suggestion is the fact that the diabetic patient is often a bad subject for surgical interference, and yet it is thought that the patient with myxedema is not much better off. The internal administration of pancreas in diabetes has given no such satisfactory results as the administration of the thyroid gland in cases of myxedema. On the following conditions Allan would be willing to recommend transplantation of the pancreas: (1) That after full and honest explanation of pros and cons the patient requests that the operation shall be performed; (2) that the patient shall not be suffering from acetonuria at the time; and (3) that a sheep shall be killed close to or in the place of operation, and its pancreas directly conveyed to the body of the patient.

Mayo Robson¹ took for the subject of his Hunterian lectures (3) the **pathology and surgery of certain diseases of the pancreas**, dealing with this subject exhaustively. The first lecture was on the symptoms and diagnosis of pancreatic lesions; the second, on the inflammatory affections of the pancreas; and the third, on cysts, injuries, and neoplasms. This discussion of the subject is most thorough and a valuable contribution to the literature.

Stewart² (Leeds) reports 2 cases of **primary malignant disease of the pancreas**. In neither of these cases was any operation performed. In the first case there was no difficulty in making a diagnosis, as there were present deep, painless jaundice and an enlarged gallbladder, which, according to Courvoisier's law, indicates cancer of the head of the pancreas. In the second case the gallbladder was not distended and the diagnosis was more difficult. The diagnosis was confirmed in both cases by an autopsy and microscopic examinations of the growth.

A very extensive and detailed dissertation on **surgery of the pancreas** is given by Haslam³ in his Ingleby lectures.

Nicholas Senn,⁴ in discussing the **surgical treatment of traumatic hemorrhage of the spleen**, records a number of interesting experiments. By experiments on animals, as well as by clinical observation, it has been shown that the spleen can be removed without any serious immediate or remote consequences. Splenectomy should be performed only for the traumatic rupture, however, when the organ itself is diseased, or when the wound implicates the main trunk of the splenic artery. Partial splenectomy may be performed if the lower part of the organ is extensively crushed or lacerated. The amputation should be done by the use of crushing forceps, and the stump covered with omentum which is sutured over it with catgut. Splenorrhaphy for the control of hemorrhage has given good results in proper cases. The wound should be closed by mattress sutures. Bleeding from the punctures is reduced to a minimum by using a double catgut suture, which, when it becomes swollen,

¹ Brit. Med. Jour., Mar. 19, 26; Apr. 2, 1904.

² Brit. Med. Jour., Apr. 16, 1904.

³ Birmingham Med. Rev., July and Aug., 1903.

⁴ Jour. Am. Med. Assoc., Nov. 21, 1903.

acts as a tampon. In bullet wounds circular through-and-through mattress sutures were usually successful in arresting the bleeding. Drainage of such wounds should always be employed. When troublesome parenchymatous hemorrhage cannot be controlled by more direct means, aseptic tamponade can be relied upon. This method of arresting hemorrhage meets with a decided disadvantage in the absence of an adequate resistance to pressure. It should never be relied upon in bleeding from arteries of any considerable size. The use of the actual cautery in the treatment of traumatic hemorrhage of the spleen has an exceedingly limited, if any, sphere of usefulness. It is not reliable, and may inflict serious damage on important adjacent structures. Senn states that marginal crushing of the wound and suturing is the most reliable procedure in arresting traumatic hemorrhage of the spleen in all cases in which it is possible to save the organ. The hemorrhage is arrested the moment the forceps are applied, and the vessels are quickly obliterated by thrombosis. Approximation of the wound edges may then be accomplished by catgut sutures.

A case of **subcutaneous rupture of the spleen treated by splenectomy** is reported by Mouchet.¹ The patient, a man, was kicked in the abdomen and showed marked signs of hemorrhage 10 hours after the accident. When the abdomen was opened, the spleen was found lacerated in a number of different places. Splenectomy was performed, and the patient made a rapid recovery. Three months after the operation he was apparently in perfect health. This is the seventh case in France of recovery after splenectomy, and in each the organ was removed because of traumatism.

Craig² (United States Army) reports 2 cases of **rupture of the spleen occurring spontaneously**. Both patients were in the United States General Hospital at San Francisco. The great rarity of spontaneous rupture is referred to. One of the 2 cases reported occurred in a patient suffering from typhoid fever, and the other in a case of primary carcinoma of the liver with metastatic involvement of the lungs. The first patient, who had typhoid fever, was a man 23 years of age. His fever was typical, and no malarial organisms were found, although looked for. The day after the patient's temperature reached normal he complained of severe pain in the left hypochondrium. This pain increased the next day, producing symptoms of collapse. Two days later he became rapidly weaker, and complained of much more severe pain over the whole abdomen. This was followed by coma and death. At the autopsy there were all the evidences of a general peritonitis. Two typhoid ulcers had nearly perforated. A large amount of blood was found confined to the region immediately surrounding the spleen, and upon examining this organ a large laceration through the capsule was discovered at the lower portion, measuring 3 cm. in length. The organ measured 20 cm. by 11 cm., and was considerably congested. The laceration was 1 cm. in depth. It is difficult to say when this rupture occurred, although it is probable that it happened at the time of the first complaint of severe pain. It i

¹ Jour. de Med. et de Chir., July 10, 1903. ² Med. News, Apr. 23, 1904.

thought that the blood might have become encapsulated had the patient survived long enough. The cause of death is attributed to the peritonitis, which in its turn is supposed to have been due to bacterial infection through the intestine. Although there was no actual perforation, several of the ulcers were shut off from the peritoneal cavity only by thin serous membrane. Cultures made from the spleen showed a pure growth of typhoid bacillus. This patient was in bed at the time of rupture, and it could not in anywise have been due to traumatism.

The second case was that of a man 60 years of age. It was evident he was suffering from carcinoma of the liver. This patient was also in the hospital and in bed at the time the rupture of the spleen occurred. At 5 a.m. it was noticed that his breathing had become difficult, and death occurred very promptly. A laceration of the capsule 9 inches in length was discovered at the necropsy. The organ measured 15 cm. by 10 cm. Carcinoma of the liver with secondary involvement of the lungs was found. It is thought that rupture of the spleen in this case was due to the pressure upon it of the greatly enlarged liver. This patient was so ill at the time rupture occurred that he could hardly move in his bed. The substance of the spleen was very much decreased, and the fact that there was a large infarct just beneath the laceration which involved it would conduce to the occurrence of rupture from pressure as the capsule over this infarct was much thinner than normal. The microscopic examinations of sections of the spleen in both cases showed nothing of interest beyond intense congestion.

Davys¹ (British Army) reports from Thibet a case of **spontaneous rupture of the spleen**. This patient was a driver and had apparently been in good health and was employed at his work up to the time of his death. At 7 a.m. the patient conversed with another driver and was apparently all right. He then lay down to sleep, and about 20 minutes later he complained of pain in his left side, near his heart. An officer saw the patient at this time and he conversed with him, describing his pain, but gave no history of any injury. He grew rapidly worse, and died a few minutes before 8 o'clock, about half an hour after the onset of pain. Davys performed an autopsy. A minute examination of the surface of the body showed no sign whatever of injury. When the abdomen was opened, a large quantity of blood under considerable pressure gushed out. The only intraabdominal lesion found was a large rupture of the spleen extending through the anterior angle to the hilum. The organ was about double the normal size, and very soft. There were no peritoneal adhesions.

A very complete history of a case of **Banti's disease in which recovery followed splenectomy** is reported by Levison² (San Francisco). Before reporting the case Levison discusses very freely the literature relating to the symptoms and diagnosis of Banti's disease. A reference to the surgical treatment of this condition shows that out of 131 splenectomies for different causes there were 16 deaths (12.2%). It should be noted, however, that deaths which resulted from errors which might

¹ Brit. Med. Jour., May 11, 1904.

² Ann. of Surg., Nov., 1903.

have been obviated, slipping of ligatures, sepsis, etc., have been eliminated; without eliminating these the mortality was 18.9 %. Prior to 1890 the mortality was 42.2 %. Without surgical treatment Banti's disease usually terminates fatally. In subjecting these cases to operation, however, the diagnosis is of the greatest importance, the mortality in splenectomy having been materially increased as a result of improper selection of cases. Maragliano and Terrille have reported a series of 16 cases of Banti's disease treated by splenectomy, with 3 deaths. In this series there was an uncertainty of diagnosis in 2 cases; in both death resulted from uncontrollable bleeding. In the third case the death was due to a perforation of the uterus during curettage for an abortion subsequent upon the splenectomy. Immediately after splenectomy for this condition there is an increase of the red and white corpuscles, without a corresponding increase in the hemoglobin; following this there is a diminution of the reds which persists for several months, when the reds gradually reach a high figure. The high leukocyte count as well as the low color-index persists for a long time. Levison's case was that of a man 27 years of age. In 1894 he operated upon him for acute appendicitis with perforation. Two days subsequent to the appendicectomy a toxemia developed in consequence of an accumulation of fluid in an acutely dilated stomach. The patient vomited great quantities of an offensive blackish fluid, and appeared to be *in extremis*; temperature, 104.5° F.; pulse, 150. As a last resort the stomach-tube was introduced, when great quantities of this fluid were evacuated. The temperature and pulse dropped immediately, and convalescence was uninterrupted. Up to 1896 the patient had remained in good health, playing cricket, etc. One day, without warning, he was suddenly seized with a hemorrhage from the stomach, vomiting large quantities of red blood, also passing blood by rectum. During this time he had never experienced any pain in the epigastrium, nor had he any cough. Subsequent to this the hemorrhages recurred frequently and were profuse, resulting in a most marked anemia and loss of weight. Between May, 1901, and November 28, 1901, there was no hemorrhage and the patient completely regained his health, when he suddenly suffered a most alarming hemorrhage from his stomach. Two days after this a blood-examination showed the following: hemoglobin, 30 %; leukocytes, 5000; reds, 2,500,000. On January 15 the blood showed the following: hemoglobin, 25 %; reds, 2,800,000; whites, 4000. Patient suffered greatly from insomnia due to an intense pain between the scapulas, necessitating the use of very large doses of morphin without material relief (up to 4 grains hypodermatically within 4 hours). This pain caused the patient more suffering than all the other symptoms combined. It persisted about one month and then disappeared. There was no enlargement of the liver, but the spleen was markedly enlarged at this time. A few weeks later marked ascites developed, requiring repeated tapings. The hemoglobin on February 9 was 22 %, and the differential count as follows: polymorphonuclear neutrophiles, 86.8 %; small lymphocytes, 6.06 %; large lymphocytes, 6.31 %; eosinophiles, 0.75 %. In March the patient

had greatly improved and gained 20 pounds. The spleen, however, extended almost to the iliac crest. On April 6 the blood-examination was as follows: reds, 3,156,666; whites, 1550; hemoglobin, 40 % (chloroform benzol). Differential count: polymorphonuclear neutrophiles, 88.5 %; small lymphocytes, 6.5 %; large lymphocytes, 2 %; eosinophiles, 3 %. The red cells stained better than on previous occasions, and the number of normal cells was larger than heretofore, the number of shadow cells and microcytes being less. At this time the operation of splenectomy was considered. He was in excellent condition notwithstanding his 40 % of hemoglobin. A marked symptom was the bronzing of the skin. On April 8, 1902, the spleen was removed. Some difficulty was experienced in delivering the organ on account of the shortness of the pedicle and its size. There was considerable oozing after the removal of the spleen, which required gauze packing. The patient made a good recovery from the operation. Two days later it was noted that the bronzing of the skin seemed to have faded and the ears and lips were a brighter red. The blood-count at this time showed: whites, 24,780; reds, 3,100,000; hemoglobin, 50 %. On the third day after operation the general impression was that the blood was nearer normal than at any previous examinations. Rapid improvement in every respect followed the operation until April 26, when the patient began to complain of pain in the right side of the neck. After this there developed an extensive induration and swelling of the neck and shoulder, which, upon being incised, was found to result from a thrombosis of the internal jugular, the subclavian, and the innominate veins. It was thought possible at first to excise the thrombosed internal jugular and the subclavian, but when the extent of the thrombosis was discovered, the operation was not carried further. The internal jugular was tied and cut at the point where it had been incised, and the wound closed. In 2 weeks the swelling had almost entirely subsided, and with this the swelling of the superficial veins of the shoulder and back was very marked, evidently due to the establishment of the collateral circulation. This dilation remained for about a year, but later disappeared. Since recovery from the last operation the patient has gained 60 pounds, has had no further hemorrhages, and feels stronger and better than he had for years. There is no glandular involvement. The bronzing of the skin has entirely disappeared. The following blood-examination was made June 3, 1903, this being about 14 months subsequent to the splenectomy: red cells, 6,400,000; whites, 9500; hemoglobin, 96 %. After preservation in formaldehyd solution since the date of operation the spleen now measures 21.5 cm. by 14.5 cm. by 8 cm., and its weight, wet, 1350 grams. "The sections stained for the tubercle bacilli did not show any, and those stained in eosin and methylene blue failed to reveal the presence of any other microorganism. None of the sections stained well. The capsule of the spleen is very much thickened, as is the connective tissue throughout the spleen. Around the larger vessels this is particularly noticeable; some of the largest vessels are surrounded by a dense band of thick fibrous tissue. There is a great deal of iron-free blood-pigment (hematoidin) throughout the spleen,

both in the central and in the peripheral portions, but more in the periphery than in the center. The pigment is deposited mainly in the interstices between the cells. There is very little evidence of active phagocytosis; only here and there are seen a few polymorphonuclear leukocytes containing pigment and other detritus. There are none of the large endothelial phagocytic cells to be seen. The malpighian bodies are apparently not increased in size nor relatively in number."

Nicholas Senn¹ reports a very interesting case of **splenomedullary leukemia successfully treated by the röntgen-rays**. Previously he had reported 2 cases of pseudoleukemia which recovered under the same treatment and have continued well since. The present case is that of a Jewess, 29 years of age. The enlargement of the spleen was first noticed 14 months previous. The spleen was so large as to cause a marked separation of the recti, which greatly facilitated the examination of the organ. It extended nearly to the pubes below, and 2 inches beyond the median line, on a level with the umbilicus. The splenic dulness extended as far up as the sixth rib. This case appeared hopeless, but it was thought worth while to try the effect of the röntgen-rays. When this treatment was begun, February 3, the blood-examination yielded the following result: erythrocytes, 3,500,000; leukocytes, myelocytes, and eosinophiles, 64,800; hemoglobin, 56 %. The eosinophiles were numerous, and the poikilocytosis was very pronounced. The treatment had to be suspended for a day or two on several occasions, owing to a high temperature or other symptoms of intoxication. The constitutional symptoms became very prominent at the time the spleen first presented indications of progressive decrease in size—about 3 weeks after the beginning of the treatment. Frequent blood-examinations were made and improvement in the blood kept pace with the reduction in the volume of the spleen. The first decided changes observed were the gradual disappearance of the myelocytes and eosinophiles and the return of the erythrocytes to their normal shape. An examination of the blood made April 12 showed no myelocytes, only a very few eosinophiles, and very little poikilocytosis. The patient was able soon to leave the hospital, but the treatment was kept up. The second week in June the spleen was apparently of normal size. The patient returned to her home a few days later in excellent health. Menstruation, which had been suspended for a year, returned at regular intervals, and the last blood-examination revealed no abnormalities in the structure and relative number of red blood-corpuscles and leukocytes. The recovery in this case is attributed entirely to the röntgen-rays. Senn states that there can be no doubt as to the microbic origin of leukemia nor of the antimicrobic action of the röntgen rays. The rays were applied in this case not only to the spleen itself, but also to the lower end of the sternum and the epiphyseal extremities of the long bones.

¹ Med. Rec., Aug. 22, 1903.

PLATE 5.



Beck and Cobb's case of traumatic asphyxia. Discoloration following forcible compression of the thorax. *Ann. of Surg.*, April, 1901.

DISEASES OF THE RESPIRATORY ORGANS.

An instructive paper on **traumatic asphyxia** is presented by Beach and Cobb,¹ who report a recent case of this condition in which recovery was obtained and in which a careful study was made of the minute pathology. This is the only case in which a microscopic study of sections of skin taken from the living subject has been made. The striking discoloration which follows forcible compression of the thorax so that breathing cannot take place for several minutes is well illustrated in the accompanying illustration (Plate 5). In all literature the authors have been able to find but 6 cases of this condition reported in which the patients have recovered. One case was reported by Burrell and Crandon (see YEAR-BOOK for 1903) and the other 5 by German observers. The authors' case was a man 30 years of age who was in perfect physical health at the time of the accident. He was caught and held by a freight elevator. The patient was released from his position in from 3 to 5 minutes. While being released, his face became black and blood ran from his nose and mouth and his eyes protruded. He was unconscious for a few minutes after being released. At the time of his admission to the hospital, one hour later, he was perfectly conscious, but dull and sluggish. Extensive bruises were found over the trunk. In the left groin and back low down there was a large, fluctuating hematoma. The eighth and ninth ribs on the left side were fractured, and about them was a moderate amount of emphysema. The skin of the head and neck was of a blue-black color, as is shown in the illustration, and the conjunctivas were very much injected. Pressure on the blue-black skin did not cause it to pale completely, as is the case in cyanosis, but, on the contrary, had little effect. The line of demarcation in the neck in front was sharp, the transverse line running from the inner ends of each clavicle. An unusual feature in this case was the fact that the double triangle of the trapezius muscle was marked out very clearly, none of the other skin at the back of the neck showing discoloration. There were no retinal hemorrhages. At no time was the patient very sick, excepting on the third day, when his temperature rose to 106°. At this time his breathing was labored. There was slight bloody expectoration, and there were plentiful rales in both lungs. This condition subsided in 24 hours. Repeated aspiration of the hematoma and later incision and drainage were necessary. On the second day after his admission pieces of skin were removed from the discolored area for microscopic examination. The discoloration disappeared rapidly after the third day, apparently simply fading out; the areas of normal skin between the punctate color-spots became larger and wider; the general color scheme turned from black to lead color, to a slightly cloudy appearance of the skin, and 3 weeks afterward the patient's face seemed almost normal, having only a slightly suffused appearance. The authors present a brief summary of the 6 reported cases of this condition. The dominant and diagnostic feature

¹ Ann. of Surg., Apr., 1904.

in these cases has been the blue-black discoloration of the skin, mainly confined to the face and neck above the clavicle. One of the theories held as to the cause of the discoloration is that of Perthes, who maintains that the discoloration is due to the extravasation of blood (either minute or more extensive subcutaneous effusions or hemorrhages). In the present case every section of skin studied showed it to be normal, and there were no signs of blood in the tissues outside of the bloodvessels. This study disproves entirely the theory just mentioned. The authors believe that the discoloration is due to stasis from mechanic overdistention of the veins and capillaries, with or without paralysis from engorgement of or pressure on sympathetic nerves. They believe that the sharp limitation of color to the head and neck is due, as suggested by Perthes, to the lack of valves in the jugular and facial veins. It is thought that the immediate employment of artificial respiration with the administration of oxygen might resuscitate certain of these cases could the method be applied at once.

Arnold Schwyzer¹ (St. Paul) reports a most interesting case in which **a foreign body was removed from the right lower lobe of a lung through a bronchoscope.** Bronchoscopy is the outgrowth of esophagoscopy, and its perfection has been largely due to Killian, of Friburg. The instrument may be used in two ways, either through the mouth and larynx or through a tracheotomy wound. The latter is more satisfactory and more easy of accomplishment. The case reported is that of a woman, 48 years of age, who was supposed, while eating soup, to have allowed a bit of bone to get into the trachea. Although all the patient's pain was referred to the left side of the chest, a diagnosis was made of lodgment in the right lung, because of the rales heard in this locality and the frequent attacks of coughing and dyspnea. An unsuccessful attempt was made to pass the bronchoscope through the mouth and larynx after the application of 1 : 10,000 adrenalin containing 20 % of cocain. The failure was supposed to be due to a large goiter which made pressure upon the sides of the trachea. It was, therefore, determined to do a preliminary strumectomy. This was done, the trachea exposed, and the wound-edges separated from it by means of packing. Two weeks later the packing was removed and the trachea opened without an anesthetic. Cocain was then applied to the trachea and the bronchoscope introduced. After repeated and prolonged examinations Schwyzer was able to locate the foreign body. The bone was seen when the tube had entered 15 cm. beyond the tracheal opening, and the tracheal opening was 3 cm. above the incisura sterni. The tube employed was 15 cm. up to its thickest portion, and had a lumen the caliber of a No. 24 bougie. After repeated efforts the bone was caught with a forceps. It was, however, too large to be brought through the small bronchoscope, therefore the tube and the forceps were withdrawn together. The situation of the bone was about 3 cm. beyond the end of the tube, and it was this that rendered its removal so difficult. The patient stood the operation well, although it lasted from 9.45 to 11.55 a. m. Much of the time was

¹ Ann. of Surg., Feb., 1904.

taken up in giving the patient rests and in cocainizing the field of exploration. The patient left the hospital on the third day after the operation. A strong plea is made in favor of the use of this instrument, which has been spoken of slightly by a number of authorities.

Carl Beck¹ discusses **costal and thoracic resection for pyothorax**, paying particular attention to the exploratory method. It is shown that the large majority of cases of pyothorax are operated upon too late—that is, at a time when lung-expansion is not apt to take place. One great reason for this delay in thorough drainage of the chest is the ease with which aspiration is accomplished. Aspiration of pus in the pleural cavity is strongly condemned by Beck, as is also simple incision between the ribs. In practically all the cases a rib should be resected and thorough drainage established early in the disease. By neither aspiration nor simple incision can the large masses of lymph which form be removed from the pleural cavity, and Beck states that in 55 % of his own cases solid masses have been found in the cavity. Aspiration should be reserved exclusively for exploratory purposes, for the cure of sero-thorax, and as a preliminary procedure when patients are extremely exhausted. When it is used, the suction method of Bulau should be employed. Rib resection, however, is safer and requires less care than this method of aspiration. Injury of the intercostal artery happens much more frequently in simple incision than in resection of the rib, on account of the situation of the artery below the inner surface of the rib. Fatal hemorrhage also from this vessel after incision has been reported a number of times. If it should be injured during resection of the rib, it can be easily caught and tied. A number of operators have reported cures after very free rib-resection in cases of tuberculous pyothorax. These cases also should be operated upon earlier than is usually advised, as the chances for recovery are much better under such circumstances. Mixed infection is generally present in this variety of pyothorax. In double tuberculous pyothorax no radical operation is proper. Beck refers to numerous papers which he has published upon the treatment of long-standing pyothorax, in which liberal rib resection as well as the removal of the costal pulmonary pleuras was necessary. He recommends a method which consists in the resection of the rib above the point of the existing sinus, the thorough exploration and examination of the cavity, and then the gradual removal of all necessary ribs and pleura. He believes that this gradual method, in spite of the irregular incision which it requires and the scar which results, is preferable to the primary extensive resection of ribs, regardless of the exact shape and dimensions of the cavity. Old cavities are most apt to exist in the scapular region, and it may frequently be necessary to remove a portion of the scapula with the ribs in order to cause an obliteration of the cavity. Numerous illustrations are presented showing Beck's method of treating these cases. [We are persuaded that Dr. Carl Beck is in the right when he says the simplicity of the operation of aspiration is responsible in many cases for the common delay in performing radical operation. We are persuaded that

¹ Ann. of Surg., Mar., 1904

aspiration should not be used with any notion of effecting a cure. We would not aspirate an abscess with such a hope, and we should not essay the hopeless attempt upon an empyema. Empyema, if allowed to run its course, is a fatal disease, and if proper operation is delayed, produces permanent crippling or even destruction of the lung. Aspiration with the thought of obtaining cure is delay—it is dangerous delay; it is unjustifiable delay. It would be well were medical practitioners to abandon it.]

Schiller¹ (Chicago) deals with the **treatment of empyema of the thorax**, devoting much space to a comparison of the permanent aspirating drainage of Bülow with rib resection and drainage by tube. The advocates of Bülow's method claim for it many advantages, the chief of which, however, is the avoidance of pneumothorax. Schiller shows very conclusively that there is no danger of acute pneumothorax when rib resection is performed and a drainage-tube is inserted. The mechanics of the question are largely dealt with, and it is shown that pneumothorax is just as apt to occur through the entrance of air around the aspirating cannula of Bülow as when rib resection is done, and that in neither instance is this condition at all likely to arise. Even with the improvements shown in the Perthes apparatus the conditions are not altered. Bülow's drainage, it is stated, can never become a method for general use. Under the following circumstances, however, it may be employed in empyemas of both sides, in cases of acute empyema, which Ziemssen called "*empyema acutissimum*," a rare disease, one seldom mentioned in literature, and which produces a severe form of dyspnea; and in chronic empyema discovered very late, and which has already produced severe cachexia. Even in these cases incision in the intracostal space can compete with Bülow's method. The operation strongly advocated by Schiller is rib resection and thorough drainage with two tubes. The best time to operate is immediately after the diagnosis of empyema is made, and the place for incision is at the ninth rib, between the scapular and posterior axillary lines. It is stated that there is no necessity of removing the pus slowly and thus prolonging the operation: accidents do not follow the rapid evacuation of pus, but may the sudden withdrawal of serous exudates. As soon as possible after the operation the patient is allowed to get up and go into the open air. This simple operation will not cure all cases. The cause of failure may be due to one of the following conditions: 1. Incomplete expansion of the lung by early and high adhesions of the lung to the parietal pleura. 2. Thick pseudomembranes around the lung or obliteration of the alveoli and fibrous retraction of the lung, as it occurs in all chronic cases. 3. Copious suppuration of the pleura. 4. Tuberculosis; actinomycosis. 5. Diseases of the lungs. For these conditions the method either of Estlander or of Schede must be resorted to. Tuberculous empyemas are divided as follows: 1. The miliary tuberculosis of the pleura. 2. Direct continuation of the process from the lung to the pleura. 3. Perforation of a tuberculous cavity into the pleural cavity. Empyema does not

¹ N. Y. Med. Jour., June 18, 1904.

necessarily follow these forms; very often they produce only serous exudation, which, especially in the two first-mentioned forms, often shows a hemorrhagic character. In forms 1 and 2 and sometimes in form 3 the pus is sterile, tubercle bacilli only being found. When this is true, aspiration with the injection of iodoform should be practised. When, however, there is mixed infection, rib resection with drainage should be established.

The subject of **empyema** is also treated by DeForest Willard,¹ who reaches the following conclusions: "1. Early diagnosis of pleurisy and early operation are the prime elements in the avoidance of empyema. The general practitioner is the one who needs to be on the alert. 2. A test for fluid should be made with the aspirating needle, not a hypodermatic, as the latter is too small and short. Liquid, if present, should be immediately withdrawn; if purulent, further operation within a day or two is advisable, as soon as the lung expands and the heart moves toward its normal position. Aspiration should be limited to diagnostic purposes, to the withdrawal of serum, and as a preliminary operation in empyema. 3. In all cases of pyothorax, free drainage, not aspiration, should be the rule. The larger the openings, the quicker will cure be effected. Resection of ribs is imperative for exploration by the finger and for removal of fibrinous masses. 4. Washings are counterindicated, except in fetor, and even then more perfect drainage is indicated rather than irrigation. 5. In old chronic cases with contracted lung and degenerated pleura, more or less excision of the chest-wall and pleura should be performed, even to the excision of the entire extent of all the ribs. 6. Even in tuberculous empyema, benefit is derived from thorough drainage."

Leon Brinkman² describes a method of **drainage of the chest in empyema** which he has employed in a number of cases with excellent results. The method consists in the resection of a portion of several ribs with the suturing of the parietal pleura to the skin. This operation obviates the necessity for drainage, and, it is stated, produces perfect drainage and allows the thorough evacuation of large masses of lymph.

T. L. Llewellyn³ reports a case of **empyema in an infant 4 months of age** in which **recovery followed simple incision**.—[The younger the child with empyema, the greater the danger of death, and hence the more imperative the need for operation. Empyema is common in children, but not common in those under 1 year of age; at least it is not commonly recognized in the very young. Children under 1 year of age are rarely brought to the surgeon for operation. Llewellyn's case is the youngest we happen to know of operated upon for empyema.]

Karewski⁴ writes on the **surgical treatment of pulmonary abscess**. The most important causes of lung abscess are croupous and influenzal pneumonia, foreign bodies, septic emboli, infection from neighboring or distant abscesses, as from the liver, kidney, pleura, etc. The abscesses

¹ Amer. Med., May 28, 1904.

² Amer. Med., Feb. 13, 1904.

³ Brit. Med. Jour., Jan. 2, 1904.

⁴ Munch. med. Woch., 1903, vol. i, Nos. 39 and 40; Amer. Med., Mar. 12, 1904.

of influenza are usually multiple, and the suppuration chronic. The abscesses produced by foreign bodies should not be operated upon until the causal agent has been removed by bronchoscopy. Empyema is oftener secondary to lung abscess than lung abscess to it. Many abscesses heal spontaneously through perforation into a bronchus, but even after perforation it does not necessarily mean that the patient's condition will be cured. It may continue to suppurate and break out later, and sometimes chronic sepsis will be the result. The indications for an operation exist, therefore, so soon as a diagnosis is made with certainty, and grave general symptoms do not disappear quickly, or if they should, reappear after a spontaneous rupture into a bronchus. Expectant treatment is permissible in young individuals, in small abscesses in the pulmonary apices, or in large abscesses in the base, if they belong to the acute variety, and are not associated with too serious a symptom-complex.

The treatment of pulmonary fistulas is considered by Garré.¹ In bronchial fistula, if the tract is short and not densely surrounded with cicatricial tissue, the cure may be perhaps accomplished by the use of the cautery. Such good fortune, however, is the exception and not the rule. The degree of surgical interference indicated depends upon the extent and character of the fistula. The closure of some fistulas is prevented by thickened and indurated pleura or by adhesion of the pulmonary pleura to the margins of the external opening. In still other cases adhesion of a fistula to the periosteum of a rib may prevent healing. Occasionally in some of the cases excision of the thickened parietal pleura, in others simple separation of the pleura from the thoracic wall, will result in a cure. In other cases removal of the ribs is necessary. Care is advised in the curettage of pulmonary fistulas, since it may open other bronchial branches. Extensive rib resection is not to be advised, especially in young children, unless absolutely indicated by the conditions. In cases of atelectasis, and especially when this condition is associated with bronchial fistula, Garré states that it is more important to liberate the lung than the thoracic wall.

W. T. Hayward² reports an interesting case of a pneumothorax due to pulmonary hydatids. In this case it was thought that the condition was due to tuberculosis, and a rib resection was performed by Giles. When the rib was removed, the pleura did not bulge, but was sucked in; blood-stained serum escaped when the pleura was opened. A drainage-tube was inserted. The patient recovered with a collapsed lung. Later she expectorated a mass that was described as "skin." Under the microscope the "skin" showed typical lamination. The patient rapidly recovered after the mass was gotten rid of.

Postoperative pneumonia with a report of experiments to determine its pathogeny is discussed by W. L. Chapman,³ who presents the following conclusions: "1. Prophylaxis. Care in ether-giving lessens

¹ Deut. med. Woch., 1904, No. 15.

² Austral. Med. Gaz., Nov. 20, 1903.

³ Ann. of Surg., May, 1904.

shock and respiratory irritation, which reach their maximum when an unnecessarily large amount of ether is given. 2. The disinfection of the mouth and oropharynx by hydrogen dioxid before operation is a rational precaution. 3. Adequate air-space is of even greater importance in surgical wards than in medical. 4. A careful auscultation and percussion of the chest should precede every operation, and if there are signs of disease, operations of election should be postponed until the chest condition is more favorable. 5. A complete clinical record of all cases of post-operative pneumonia, together with a record of the previous state of the patient, is most desirable, and such records will in time greatly enrich our incomplete knowledge of the factors which predispose to the complication."

DISEASES OF THE VASCULAR SYSTEM.

A case of **purulent pericarditis associated with empyema** in a child 2½ years of age is reported by Coutts and Rowlands.¹ The patient's illness commenced with pneumonia one month before admission to the hospital. The child presented distinct evidences of rickets. A diagnosis was made of empyema of the right base, with purulent pericarditis. Rowlands opened the pericardium under chloroform anesthesia. He made an oblique incision, exposing the fifth costal cartilage and the neighboring portion of the sternum. The sternal half of the cartilage was removed, the internal mammary vein exposed, the left pleura displaced outward after the removal of a portion of the sternum itself, and the pericardium explored with a needle. Thin, greenish-yellow pus was withdrawn. The pericardium was then opened, and fluid gushed out, reaching to a height of 3 feet as it emerged. A rubber drainage-tube was inserted and the wound partially closed. The patient improved immediately after the pericardium was opened, the cyanosis diminishing and the pulse becoming better. A growth resembling the pneumococcus was developed from the pus. The day following this operation the right pleura was explored and pus found. Rib resection was then performed under chloroform anesthesia, a quantity of pus being evacuated. The patient died 16 days after the operation. At the postmortem, in addition to the evidences of the conditions already described, an abscess containing about 3 ounces of pale pus was found between the pericardium and left lung. Several other small abscesses were found about the pericardium. Rowlands discusses the surgery of this condition, describing the various operations which have been devised for drainage of the pericardium.

Arthur Hall² describes a case of **pyopericardium following puerperal sepsis**. The presence of pus in this case was demonstrated by the exploring needle, and the fluid was evacuated by Wilkinson after the removal of a portion of the fourth rib and its cartilage. The pleura was not exposed. The fluid in the pericardium gushed out with considerable force when the sac was opened. Altogether 20 ounces of pus

¹ Brit. Med. Jour., Jan. 2, 1904.

² Lancet, Oct. 3, 1903.

were removed. The cavity was drained by a tube. The patient showed many signs of improvement, but died one week after the operation and about 5 weeks after her confinement. At the postmortem examination, in addition to the lesions of purulent pericarditis, there was a small purulent pleuritic effusion of the right side and also evidences of general suppurative peritonitis, with extensive matting together of the abdominal contents. This condition was worse in the pelvis. Examination of the pus from the pericardium showed streptococci and staphylococci. It is noted that there was not audible at any time a pericardial friction-sound.

The question of **drainage of the pericardium** is discussed by Mintz,¹ who states that the method of excising the fifth costal cartilage for the purpose of exposure of the pericardium in cases in which drainage of this cavity is indicated does not give a satisfactory opening for drainage, as it does not correspond with the lowest point of the sac. Mintz has conducted a number of dissections with the idea of discovering the best point at which to open the pericardium for drainage, and has devised the following method: An oblique incision 7 cm. in length is made along the lower margin of the seventh costal cartilage on the left side, commencing at the angle formed by the ensiform process and the costal margin. The abdominal muscles are detached from the posterior surface of the seventh cartilage, which structure is then divided at each extremity of the wound, separated from the diaphragm, and turned upward. The internal mammary artery is thus exposed and can easily be ligated. The diaphragm is then depressed, which exposes the antero-inferior margin of the parietal pleura to the inner side, and above this may be seen the dense pericardium, which may be incised and a drainage-tube inserted. Even on the cadaver, when the pericardium is opened in this manner, there is usually an escape of fluid. Mintz has successfully performed this operation once on the living subject in a case of suppurative pericarditis.

J. A. Scott,² in reporting a case of **purulent pericarditis secondary to pneumonia**, refers extensively to the literature of this subject, and also presents some statistics of cases occurring at the Pennsylvania Hospital. The case reported is that of an Italian laborer 36 years of age. He was admitted to the hospital because of a pneumonia. At no time was a pericardial friction heard, but on the thirteenth day distention of this sac was distinct. On the twenty-fifth day the symptoms of pericardial distention were well marked, and an exploring needle introduced into the fourth interspace withdrew 10 cc. of turbid, light-greenish fluid, which produced a pure growth of pneumococci. The next day 14 ounces of turbid, seropurulent fluid were withdrawn, with almost immediate relief to urgent symptoms. Seven days later the fluid had reaccumulated, and exploratory puncture showed thick yellow pus. At this time Le Conte exposed and opened the pericardium. Chloroform anesthesia was at first attempted, but the struggling and cyanosis were so marked that local anesthesia with cocain was substituted. The peri-

¹ Zent. f. Chir., 1904, 3.

² N. Y. Med. Jour., Jan. 30, 1904.

cardium was exposed through the fifth interspace, at the point of the normal apex-beat. Between one pint and one quart of nonodorous pus was liberated. An examination of the fluid showed many leukocytes and pneumococci. The patient was very ill for some time after the operation, but ultimately recovered. The following interesting features of the case are enumerated: 1. The absence of a leukocytosis during the pneumonia, and its development with the pericarditis. 2. The absence of the pericardial friction both before and after the pericardium was opened. 3. The absence of fever—subnormal temperature—with pus in the pericardium. 4. The recovery of the patient without the physical signs of an adhesive pericarditis. Four months after the operation the patient had gained in weight and looked fairly well.

An interesting case of **traumatic hematopericardium** is recorded by J. L. Morse.¹ The patient was a child, 2½ years of age, who fell upon a needle which entered the chest near the right edge of the sternum and broke off. A superficial examination was made, but no needle found. The patient was apparently well for 2 weeks, when her appetite failed, respiration became difficult, and she complained of pain. Morse saw the patient one month after the accident, when there were evidences of a distended pericardium. The patient's temperature at this time was 100.6°, pulse 130, and respirations 50. A radiograph showed the cardiac shadow greatly enlarged; the needle was not visible. The physical signs were not characteristic of fluid distention of the pericardium, but the radiosopic examination was. An aspirating needle was introduced into the fifth intercostal space at the edge of the sternum, and fluid blood escaped. At first it was thought that the heart cavity itself had been punctured. Altogether 500 cc. of dark bloody fluid was withdrawn. The patient recovered. Later the needle was shown by the x-rays to be situated behind the sternum. Its removal was advised, but declined. Morse believes that the needle did not in the first place enter the pericardium, but gradually worked its way into this cavity.

A case of **resuscitation by massage of the heart 45 minutes after apparent death** is reported from the Kiel Clinic by Paul Sick.² The patient was a boy, 15 years of age, who was being operated upon for tuberculous peritonitis. Suddenly there was an arrest of heart-action and respiration. Artificial respiration and König-Maas massage of the heart were resorted to, with the result that for a minute or two respiration returned, but it ceased again, and 30 minutes after the onset of symptoms the patient was pulseless, without respiration, and apparently dead. Rapid exposure of the heart was then made by a Rotter incision, and direct massage applied to the organ, with the addition of warm compresses. Fifteen minutes later, or one hour after the onset of the symptoms, there was some voluntary heart-action, and in half an hour the organ was performing its function regularly. Respiration was also resumed. The pericardium was closed, and the external wound closed with drainage. Consciousness had returned 2 hours later, and the pa-

¹ Boston M. and S. Jour., Mar. 3, 1904.

² Zent. f. Chir., Sept. 5, 1903, No. 36.

tient complained of thirst and dyspnea. His condition remained about the same for 24 hours, when symptoms of collapse developed and he died, after remaining in a comatose state for 3 hours. An autopsy revealed slight fibrinous pericarditis. It is thought that in a stronger patient the restoration of circulation and respiration might have resulted in complete recovery. Chloroform was the anesthetic used in this case.

An interesting case of **stab wound of the heart** is reported by Orlandi.¹ The patient was a man 26 years of age who received a stab wound in the third left intercostal space. The patient walked quite a distance after the receipt of the injury, without knowing that he had been seriously hurt, until he began to bleed profusely. He was operated upon 1½ hours later and a peculiar V-shaped wound of the left ventricle was discovered. This was closed with two silk sutures. The patient recovered from the operation and regained consciousness, but died ¾ of an hour later. At the necropsy it was found that the stitches had broken and that the patient had suffered from renewed hemorrhage in the pericardium and pleura. The left pleura was injured by the knife, which entered the left ventricle 1 cm. from the left edge at about the middle. When the inner surface of the ventricle was examined, it was hard to find the injury, but when the tendons of the papillary muscle were cut, an irregular, quadrilateral wound measuring 2 cm. across was discovered. The transverse direction of the wound made it impossible to avoid an enormous strain on the sutures during systole, and it is thought that this accounts for the breakage of the silk. Orlandi has previously pointed out that a transverse wound causes much more profuse hemorrhage and much more rapid death than a vertical wound. Attention is also called to the fact that it is impossible to draw any inference as to the kind of instrument which produced the injury from the shape of the wound in the heart.

Tuffier² records a most interesting case of **extraction of a bullet from the heart muscle**. The patient was a man, 24 years of age, who received a pistol wound in the left side of the chest. At the time there was no serious symptom, nor did any develop for some weeks afterward. After a time, however, the patient suffered from persistent palpitation and attacks of dyspnea. These increased and caused great discomfort, especially after any form of exercise. Tuffier saw the patient for the first time 7 months after the receipt of the injury. There was a small cicatrix in the second intercostal space on the left side, about half an inch from the margin of the sternum. Examination with the x-ray revealed the bullet apparently fixed in the heart-wall on the left side of the base. It followed all the cardiac movements. The bullet was seen opposite the third intercostal space. Because of the increasing symptoms it was determined to remove it. A portion of the second rib with its costal cartilage was resected. Tuffier, guided by the Contremoulin magnetic indicator, reached the projectile by blunt dissection, and re-

¹ Il Morgagni, Oct., 1903.

² Bull. et Mém. de la Soc. de Chir. de Paris, 1903, No. 32.

moved the bullet from the wall of the auricle. The patient made a speedy and complete recovery. Poirier and Bazy, in discussing the case, expressed doubt as to the exact situation of the bullet. The fact that the bullet had remained at the base of the heart and had not dropped to the lower part of the pericardium, and also the absence of inflammatory effusion within the sac, cause the speakers to believe that the foreign body had not penetrated the pericardial cavity or wounded the heart itself.

McArdle¹ reports a case of **spear wound of the heart**. The spear, which was barbed, entered near the lower angle of the left scapula and projected at a point midway between the left nipple and the midsternum, a little above the nipple-line. The sixth rib was resected, and it was found that the spear had passed through the wall of the left ventricle, but had not entered the heart cavity. The spear was withdrawn, and the wounds completely closed. Attempts to remove the spear while it was still fixed in the wall of the heart produced profound syncope. It was finally removed after dividing the portion of heart muscle over it. The patient made a prompt and uneventful recovery.

Schwerin² (Berlin) reports a case of **stab wound of the right auricle**. The patient was admitted to the hospital three-quarters of an hour after the receipt of a stab wound 6 mm. in length in the fourth intercostal space. His fourth and fifth ribs were resected, and a perforated left lung was found firmly united to the sternum. The pericardium was opened. "As the right heart was rolled up under the sternum, a stream of blood the size of a lead-pencil spouted forward in a slight curve. The heart was pulled forward by a traction thread passed through its apex, and in this manner a wound in the right auricle became visible. Digital compression and interrupted silk sutures. Pericardium and musculature sutured. Tamponade of the former and of the pleura. Recovery complicated by pyopericardium, empyema, and pneumonia. Patient now works as a locksmith without any symptoms." Noll (Hanau), in discussing Schwerin's paper, reported a case of **gunshot wound of the heart**. The patient was a girl, 17 years of age, who was shot with a revolver of 7 mm. caliber. The patient was seen 1½ hours after the injury, when she was in a condition of great respiratory distress. The wound traversed the fifth intercostal space, the pericardium, and the anterior wall of the left ventricle. The heart was exposed and the wound sutured without difficulty. The pericardium was drained with sterile gauze, which was removed in 24 hours. A circumscribed empyema resulted, but the patient made a good recovery. During more than 6 months the patient has remained well. Schwerin thinks that extensive resection of the thoracic wall is unnecessary and dangerous in such cases. Resections of portions of 1 to 3 ribs and traction of the divided pericardium into the wound give ample room for all purposes.

Wolff³ reports 3 cases of **stab wounds of the heart** sutured by

¹ Jour. Roy. Army Med. Col., vol. i, No. 2.

² Proc. German Surg. Cong., 1903; Ann. of Surg., Dec., 1903.

³ Deut. Zeit. f. Chir., Bd. lxxix, No. 1; Ann. of Surg., Dec., 1903.

Barth, of Danzig, and discusses a collection of 42 cases with 17 recoveries. The first case reported was that of a man, 28 years of age, who received a wound 2 cm. long in the right ventricle. This wound was closed with 3 silk sutures. The pleural and pericardial wounds were also sutured, and the external wound drained; the patient died on the fourth day. The autopsy showed that the knife had severed one of the large trabeculas of the right ventricle, and had divided the tricuspid valves completely. The entire pericardial cavity was found to be filled with fibrin. The second case was a man 28 years of age. The wound in this case was in the left ventricle, 0.5 cm. from the coronary artery. The hemorrhage from the wound had ceased when the heart was exposed. The wound was closed with 3 silk sutures. The wound in the pericardium was closed without drainage and the patient recovered. The third patient was a man 22 years of age, and in this case, in addition to the heart wound, the internal mammary artery was divided. The wound of the heart was in the right ventricle, near its junction with the auricle. It measured 0.75 cm. in length, and blood escaped from it when it was exposed. It was closed with 5 silk sutures. The wounds of the pericardium and pleura were both sutured, and the external wound was drained. Considerable dyspnea and right-sided pleurisy with effusion resulted. Wolff thinks that bullet wounds of the heart had better be treated expectantly. He believes that the best method for exposing the heart is that of Giordano, who advises following the wound and removing whatever tissue is necessary to expose the heart freely. The best suture material is silk. It is best in most cases not to drain the pericardium, on account of the danger of carrying infection inward. It is advisable to drain only when infection is present or when uncontrollable hemorrhage exists.

[We cannot agree with Wolff regarding the treatment of gunshot wounds of the heart, although the results from operation in these cases have not been nearly so satisfactory as those following stab wounds. Successful cases have been reported and these should encourage us to attempt repair of gunshot wounds of the heart wherever the opportunity offers. A successful case was reported at the German Surgical Congress by Noll. Another successful case operated upon by Launay and reported by Peyrot can be found in the YEAR-BOOK for 1904.]

Brauer¹ (Heidelberg) discusses **cardiolysis and its indications**. About a year ago Brauer described a method of treatment for chronic adhesive mediastinopericarditis. In this case, the heart, pericardium, and great vessels become adherent to the neighboring structures, such as the sternum, anterior and posterior mediastinum, diaphragm, and lung. According to the position and consistence of these bands, various symptoms arise. Often the cardiac movements are communicated to the neighboring organs, or there is obstruction to heart-action and to the emptying of the blood from the heart into the great vessels. The question is whether or not these cases might not be relieved by lightening

¹ Proc. German Surg. Cong., 1903; Ann. of Surg., Dec., 1903.

the cardiac work by resection of the ribs in appropriate cases. Petersen and Simon operated according to Brauer's method in 3 cases, and in all improvement was satisfactory, the edema, dyspnea, cyanosis, and ascites diminishing. One of the cases died from bronchopneumonia after showing essential improvement.

The Committee on Research for the Division of Surgery, Harvard Medical School, has carefully investigated the **value of blood-pressure observations in surgical cases**, and reports¹ in detail the results. The report is extensive, but the conclusions of the Committee may be summarized as follows: "That the value of the Riva-Rocci apparatus in determining the blood-pressure in surgical patients is limited to a comparatively small number of cases. The conditions of cerebral compression and of surgical shock produce the most marked and definite alterations in the blood-pressure. When these conditions are present and other confusing causes of alteration in the blood-pressure are eliminated, the value of the blood-pressure determinations as an indication for or against operation is increased. Under other circumstances the value of these observations is at present not apparent. The adoption of blood-pressure observations in surgical patients does not at present appear to be necessary as a routine measure."

Carl Beck shows² the result of an operation for an aggravated case of **aneurysma racemosum**. The condition began to develop 17 years before operation, and 2 months after the patient had been struck in the center of his forehead by a stone. The patient had suffered from 2 violent hemorrhages because of rupture of the thin skin overlying the tumor. Removal of this growth was carried out in 3 stages. In the first operation the temporal arteries were ligated; 4 days later the frontal and angular arteries were tied. These procedures caused slight diminution of the size of the tumor and lessening of the pulsation. The second operation was followed 5 days later by a third, which consisted in extirpation of the tumor. In spite of the previous ligations, extirpation was accompanied by profuse hemorrhage. The recovery was uneventful.

Barnard and Rugby³ (London) report a very interesting case of **gunshot wound of the head under the title of pulsating exophthalmos due to traumatic aneurysm of the internal carotid artery**. When the patient came under their care the second day after the injury, there was a ragged wound running upward and backward through the superior maxillary bone to the base of the skull, which was perforated and crushed in the region of the left petrous bone. The wound was foul and the breath fetid. The left side of the face was paralyzed completely. The left eye was protruded and the pupil dilated and fixed. Complete external ophthalmoplegia was present, and the left cornea was insensitive; the eyelids were swollen and very prominent. When the eye was palpated, it was found to be pulsating vigorously; a thrill was present, and a bruit was heard with a stethoscope over the eyelids. On

¹ Boston M. and S. Jour., Mar. 10, 1904.

² Ann. of Surg., Oct., 1903.

³ Ann. of Surg., May, 1904.

compressing the carotid in the neck the eye receded and the pulsation disappeared. The conjunctiva was edematous, and soon this edema increased so much that the mucous membrane herniated between the lids. Because of the recent development of the supposed arteriovenous aneurysm it was thought wise to ligate the common carotid artery. This accordingly was done, two ligatures being applied and the vessel cut between them. The proximal ligature slipped off, and before the wound was closed, there was a profuse hemorrhage, which was temporarily controlled by digital pressure. It was found, upon several attempts, impossible to regain control of the proximal portion of the vessel, as it had retracted for about $1\frac{1}{2}$ inches within its sheath. When the wound was slightly lengthened and the sheath opened below the point of pressure, bleeding was so profuse that the opening in the sheath was closed. The operator then, controlling the bleeding by pressure with his right hand, opened the sheath with his left hand as far down as the exit of the vessel from the thorax. At this point the vessel was compressed between the finger and the seventh cervical vertebra, and the extremity of the vessel caught and religated. The authors state that it was a mistake to divide this vessel between the ligatures, since at the present time, with the primary healing of wounds, such a procedure is not necessary. Particular attention is called to the method by which this divided vessel was finally brought under control, since a number of cases have died because the surgeon was unable to catch the retracted vessel. The wound in the neck healed aseptically. The pulsation of the eye disappeared for 4 days; it then recurred, and finally disappeared about 10 days after the operation; but by this time the eye was blind and opaque. For 2 months the progress of the case was uneventful, the profuse flow of pus from the mouth and ear gradually diminishing. The bullet was located by means of the röntgen rays in the temporosphenoid lobe, about $1\frac{1}{2}$ inches from the surface of the skull. Two months after the original operation the patient developed symptoms of a brain abscess, and it was decided to remove the bullet. The point of the bullet was definitely located, immediately before the operation, by mean of the fluoroscope, and when a button of bone was removed from the skull, a quantity of pus was evacuated and the bullet found in the position indicated and removed. Improvement followed this operation for a day or two, but the symptoms recurred and the patient died 24 months after the accident, with signs of cerebral compression. Before his death the brain was cautiously explored, but apparently the abscess was draining freely. At the autopsy, however, a large abscess was found in the upper part of the temporosphenoid lobe, not connecting with the abscess which had formed about the bullet and which was satisfactorily drained. The second abscess had apparently developed in the bruised area in front of the bullet, and was perhaps due to supuration of an anemia, the anemia having been produced by the ligation of the common carotid. The chief points to be noted in the dissection of this specimen are: "(1) The presence of a double sacculated aneurysmal dilation in the intracranial course of the internal carotid artery. (2) That

no arterial communication with a sinus was present. (3) That, although the aneurysmal sac in the petrous bone could be accounted for by the fracture of the tegmen, no such explanation can account for the aneurysm found at the posterior part of the cavernous sinus. No radiating fracture across the base could be detected. (4) The absence of any noticeable dilation of the sinus or ophthalmic vein." The literature on the subject of pulsating exophthalmos is carefully discussed, and the following conclusions reached: "1. A traumatic sacculated aneurysm of the internal carotid in the cavernous sinus can give rise to the typical symptoms of pulsating exophthalmos. 2. This lesion can follow a head injury without being directly caused by basal fracture. 3. There is no evidence to prove that this condition does not always occur at first, and a communication with the veins is a later and secondary consequence. 4. The signs of pulsating exophthalmos are not necessarily due to the presence of arterial blood in the ophthalmic veins, and need not be dependent on excessive dilation of these veins. 5. In young subjects and in traumatic cases seen early, ligation of the common carotid is the best treatment."

Francis W. Murray¹ reports a case of **pulsating exophthalmos**, and discusses the treatment of this condition. The characteristic symptoms are exophthalmos, a pulsating tumor at the inner angle of the orbit, bruit, and pulsation. The most prominent symptom is the protrusion of the eyeball, which in most cases reaches a high degree. The lids become swollen, edematous, and discolored; the conjunctiva is chemotic, and its veins are distended and tortuous. If paralysis of the ocular muscles is present, the axis of the eye deviates, and motility is interfered with. The circulation in the superficial exophthalmic vein becomes reversed later in the disease, and forms a pulsating tumor in the upper and inner angle of the orbit. The sight at first may be unimpaired, but it later becomes weaker and blindness may result. The patient complains of severe headache, disturbing sounds in the head, and ringing in the ears. Momentary digital compression of the carotid on the affected side is followed by the disappearance of pulsation and bruit, protrusion of the bulb lessens, the pulsating tumor sinks, and the subjective symptoms are relieved, but, on removing the finger, the previous condition speedily returns. If untreated, the symptoms increase until they reach their height, when the exophthalmos, the chemosis, and the swollen lids gradually subside, but the subjective symptoms, as well as the pulsating tumor, remain and the eyesight is finally destroyed. In a few instances spontaneous cure has resulted. It is unwise, however, to expect this or to wait for it. The recognized treatment for this condition is the ligation of the common carotid artery. Compression has been employed, but the results have not been so satisfactory as those obtained by ligation. The cessation of symptoms after ligation is usually very prompt, and in the successful cases the cure is complete in from 3 to 6 weeks. The results of ligation have been very satisfactory, the mortality being much less than that of the mortality of this ligation in

¹ Ann. of Surg., Mar., 1904.

general, and secondary cerebral disturbances are uncommon. Bodon, in 1899, collected 58 cases of traumatic exophthalmos treated by ligation of the common carotid: 26 were cured, 20 improved, 6 were unimproved, and 6 died. Four of the 6 deaths were due to sepsis and hemorrhage, complications which are less liable to occur at the present time. Murray believes that the ligation of the internal instead of the common carotid offers a better prospect of cure, and should be the operation of choice. Bodon collected 6 cases in which both common carotids were ligated. The operation was attended with no mortality, and with but one exception the patients were cured or improved. The absence of mortality in this list is explained by the fact that the arteries were not diseased. In 2 of the cases a return of the symptoms appeared after 10 weeks, but a complete cure followed the ligation and excision of the pulsating veins at the inner angle of the orbit. Murray's own case was that of a man, 29 years of age, who was struck on the left parietal region with a bottle on January 8, 1902. He was unconscious for some hours, and later complained of a continuous roaring in the left side of his head, which grew rapidly worse until it extended all over his head. On the second day the left eye began to protrude and the eyelids to swell. In a week both eyes showed enormously distended conjunctivas and subconjunctival veins, and the subcutaneous veins about both eyes were also engorged, although this was most marked on the left side. The headache, which was severe during the first week, soon abated. The patient did not apply for treatment of his eye-condition until February. At this time the left eye protruded very markedly and the edema about both eyes was quite decided. He was admitted to the New York Hospital on February 26, when all the symptoms had steadily increased. At this time there was distinct pulsation of the right eye and a mass of engorged and pulsating veins could easily be felt. The axis of the left eye deviated outward and its motility was impaired. On March 1 the left common carotid was ligated, the pulsation and bruit immediately ceasing when the ligatures were tied. The exophthalmos and all other symptoms gradually subsided, and the patient left the hospital on the tenth day. The engorgement of the subconjunctival veins diminished but little. The patient was not seen until a year after this operation, when there remained a slight degree of exophthalmos of the left eye and less subconjunctival engorgement. There was no bruit or pulsation anywhere to be discerned. The eyesight was good. In June, 1903, however, the patient appeared, complaining that the exophthalmos interfered with his securing employment. On the left side this condition was most marked, and the engorgement of the subconjunctival veins had increased. Pulsation had returned in the external carotid and in the superior thyroid arteries. No pulsation or bruit could be noted, but there was a large tortuous vein extending up from the supraorbital notch. A second operation was advised, but declined. As a rule, recurrence of symptoms takes place much earlier than in this case. The protrusion of the right eyeball was undoubtedly due to rupture of each internal carotid into the cavernous sinus, and its extension by way of the

circular sinus into its fellow of the right side. Double pulsating exophthalmos may be due to rupture of each internal carotid into the cavernous sinus, but generally the rupture is unilateral, and, owing to the pressure extending to the sinus of the opposite side, protrusion and pulsation of the opposite eyeball follow, but less marked than on the eyeball on the injured side. It will be noticed in this case that subconjunctival veins remained distended, while all other symptoms disappeared; and it is evident that the requisite reduction of pressure in the cavernous sinus was never obtained. With the complete return of collateral circulation, as seen by the presence of pulsation in the external carotid and superior thyroid arteries, the sinus pressure increased, and, as a result, the exophthalmos grew larger, the conjunctival congestion became more marked, and the supraorbital vein made its appearance. The error as regards treatment was the ligation of the common carotid, and, had the internal carotid been tied, the chances of recurrence would have been lessened. Should another opportunity present in the future, Murray would tie the internal carotid. Should this patient return again, Murray states that he will resect the branches of the superior ophthalmic vein at the inner angle of the orbit, which has been so successful in one or two other cases of recurrence.

An interesting case of **traumatic aneurysm of the left subclavian artery produced by fracture of the clavicle** is presented by William Taylor¹ (Dublin). The patient was a man, 62 years of age, who received an oblique fracture of the left clavicle by a fall on the shoulder. In spite of the injury the patient went to work on the day following, but was obliged to give up. The injury was dressed in the usual way, but it was noted that there was a great deal of swelling about the shoulder. This was attributed to the use of the arm subsequent to the fracture. Two weeks after the injury there was every evidence of a large aneurysm, probably due to the injury of the subclavian. This view was fortified by an x-ray picture which showed a spicule of bone passing down in the region of the vessels. In spite of rest and treatment the aneurysm increased in size during the next fortnight, and rupture or suppuration seemed imminent. An attempt was made to ligate the first portion of the subclavian artery after resecting a portion of the inner third of the clavicle. On account of the encroachment of the tumor this was found difficult, and during the dissection the vertebral artery was injured, producing profuse hemorrhage. It was then determined to remove the middle portion of the clavicle, expose and control the artery by pressure, empty the sac, and ligate the vessel. This was done, with the exception of the ligation. After controlling the vessel by pressure and emptying the sac a forceps was put on the proximal side of the opening in the vessel and another on the distal side. The opening in the artery was about the size of a knitting-needle. Gauze was introduced between the two forceps, which were allowed to remain on for 12 days, after which the wound gradually granulated. The wound healed satisfactorily, and the patient made a good recovery, excepting that the use of the arm re-

¹ Ann. of Surg., Nov., 1903.

turned very slowly. Taylor has examined carefully the French and English literature for complications arising from fractures of the clavicle, with the following result: Ten authentic cases of injury (immediate or remote) to the neighboring nerves. Four authentic cases of wounds of the subclavian artery. Taylor's case makes the fifth. The others arose in connection with fractures produced by direct violence, and all terminated fatally, whereas his arose from a fracture produced by indirect violence, and has fortunately ended in recovery. One case of alleged injury to the innominate artery, leading to the development of an innominate aneurysm. It is more than probable that the aneurysm existed prior to, and possibly may have predisposed to the production of, the fracture. Four cases of injury to the subclavian vein. Two cases of injury to the internal jugular vein. One case of aneurysm of the acromial branch of the acromiothoracic axis of arteries and 5 cases of wound of the lung associated with emphysema.

Robert T. Morris¹ reports a case of **fusiform aneurysm of the popliteal artery treated by the Matas method**. The patient was a man 58 years of age. The aneurysm was so large that its pulsations could be observed on both sides of the knee when viewed from the front. Lymph-stasis in the leg was so marked that the leg was tense and swollen, although it had been tapped a number of times. Ligation of the femoral seemed dangerous in this case because of the condition of the leg below the seat of aneurysm. After controlling the circulation of the leg an incision 10 inches long was made over the aneurysm and through its coats. A double handful of clots was removed from the sac, and the aneurysm was determined to be of the fusiform type, with a large, thin-walled diverticulum which constituted the chief part of the mass. With No. 1 chromicized catgut a running suture was carried through the tissues of the deepest part of the sac, in such a way as to construct something more than 3 inches of new artery of a caliber estimated to be similar to that of the normal artery, and a second row of sutures was introduced for fortification. The remainder of the sac was left undisturbed and still adhering to its surroundings. Pulsation at once occurred in the new artery, and there was no leakage at any point. The foot immediately became warm, but no pulsation in the arteries of the foot could be felt, on account of the edematous tissues. The swelling of the leg began to subside immediately after the operation. The wound, which was closed without trouble, healed completely by primary union. Paralysis of sensation and of motion, which had resulted from the pressure of the aneurysm, began to disappear shortly after the operation. On the twenty-second day after operation the newly constructed artery gave the impression of being larger than the vessel on the opposite side. It is not known whether this was due to the thicker walls of the new artery or whether, in reconstructing it, a larger caliber was made. The operation done in this case differs slightly from that recommended by Matas in that there was no infolding of the overlying skin as a fortification to the sutures of the aneurysmal sac.

¹ Ann. of Surg., Oct., 1903.

It was impossible to do this in this case because of the edematous condition of the tissues overlying the aneurysm.

Bickham¹ reports a case of **arteriovenous aneurysm of the common femoral artery and vein caused by a pistol ball** which was passed from the bladder by the urethra about 2 weeks after the receipt of the injury. At no time did the patient complain of any symptom leading one to suspect the presence of the bullet within the bladder, and he could recall no urinary symptom soon after the receipt of his injury. A new method of compression with a broad rubber bandage was unsuccessful.

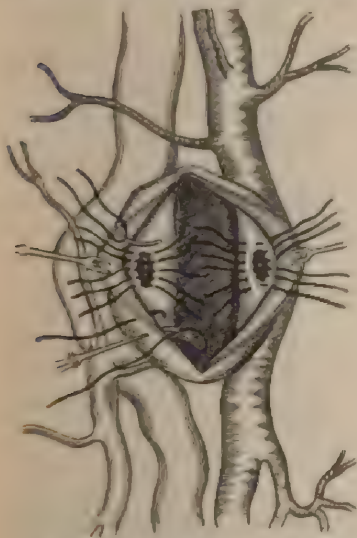


Fig. 17.—Varicose aneurysm type of arteriovenous aneurysm of left common femoral artery and vein, showing the application to this class of aneurysms of the Matas method of operating upon ordinary aneurysms. The opening of the femoral artery into the common aneurysmal sac is shown on the right, with interrupted Lembert gut sutures in position, ready to be tied. The opening of the femoral vein is seen on the left, with similar Lembert sutures in position. On the left of the sac two gut sutures are in the act of being placed, which, when tied, will approximate the roof of the sac (including skin and intervening tissues, which are not here shown) to the floor of the sac. Similar sutures will approximate the roof and floor of the sac upon the right (Bickham, in *Ann. of Surg.*, May, 1904).

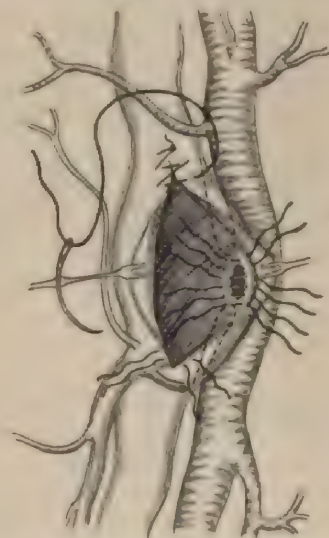


Fig. 18.—Aneurysmal varix type of arteriovenous aneurysm of left common femoral artery and vein, showing the application to this class of aneurysms of the Matas method of operating upon ordinary aneurysms. The opening of the femoral artery into the varicose vein is shown, with interrupted Lembert gut sutures in position, ready to be tied. The longitudinal incision in the vein, for approaching the arteriovenous opening (and which is here made somewhat unnecessarily long), is shown in the act of being closed by two methods of suturing—above, by the continuous Lembert of the outer coats; below, by interrupted ordinary sutures of the outer coats (Bickham, in *Ann. of Surg.*, May, 1904).

fully employed to relieve the aneurysm, which was finally cured by the proximal ligation of the external iliac artery by the extraperitoneal route. Bickham suggests the advisability of employing the Matas method in the treatment of these aneurysms. He is not aware that this suggestion has ever been made before, but believes it will apply in cases of arteriovenous aneurysm of traumatic origin. The accompanying illustrations (Figs. 17-20) demonstrate the application suggested by Bickham in these cases.

¹ *Ann. of Surg.*, May, 1904.

Binnie¹ (Kansas City) reports a case of **popliteal aneurysm** occurring in a syphilitic, 52 years of age, in which he performed the *Matas operation* with a slight modification. After removing the clot the opening between the sac and the vessel was closed, and the whole sac obliterated by several rows of Lembert sutures. The superficial wound was closed without inverting the skin. The patient made a good recovery in spite of some infection of the wound. In discussing this case Matas stated that there have been other cases reported in which infection of the wound had occurred, but that it had in no way interfered with a satisfactory result.

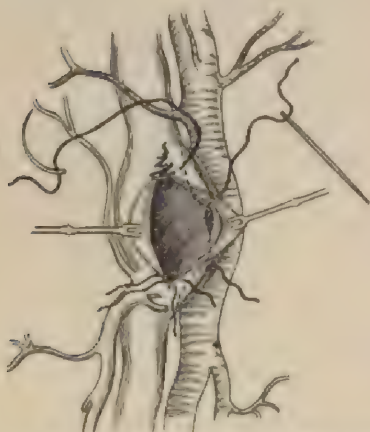


Fig. 19.—Same as Fig. 18, showing a continuous Lembert gut suture, which, having been passed through the outer coats of the thickened vein at the angle of junction of vein and artery, and knotted, is passed on between the coats of the vein until its varicose cavity is entered very near one end of, and immediately above, the first tier of interrupted sutures, and is then made to bury in this first tier and itself in continuous Lembert fashion, and, emerging at the opposite angle of junction of vein and artery, is tied in the same manner as at its entrance (this suture is not yet tightened throughout) (Bickham, in Ann. of Surg., May, 1904).

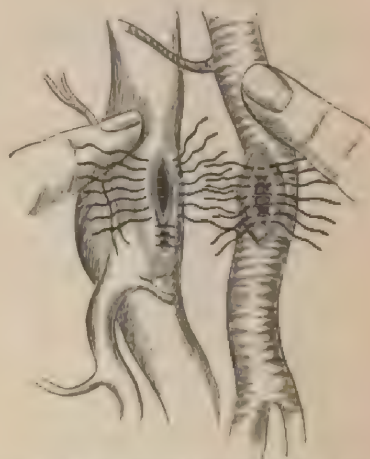


Fig. 20.—Varicose aneurysm of left common femoral artery and vein, treated by excision of the sac, followed by suturing of the openings in the vessels. Upon the right, a small elliptic piece of the sac is shown connected with the arterial opening, with the first tier of interrupted Lembert gut sutures in position, ready to be tied. Upon the left, a similar elliptic piece of sac has been left connected with the venous opening. The first row of Lembert sutures has been tied, and a second tier of ordinary sutures through all the coats is being applied, burying in the first tier. Fig. 20 is the same as Fig. 17, with the sac excised (Bickham, in Ann. of Surg., May, 1904).

R. C. B. Maunsell² (Dublin) discusses the **surgical treatment of abdominal aneurysm**, referring extensively to the literature of this subject and comparing the various operative procedures. Maunsell reports a case of aneurysm involving the abdominal aorta above the celiac axis. The abdomen was opened, 6 feet of wire inserted into the aneurysm, and a galvanic current, increasing from 1 to 65 milliamperes, employed. For a fortnight after the operation the aneurysm appeared larger than before, but from this period onward contraction took place and pulsation was less marked. Improvement continued until 40 days after the operation, when the patient complained of pain in the

¹ Jour. Am. Med. Assoc., June 25, 1904.

² Brit. Med. Jour., June 18, 1904.

left shoulder, which became constant and severe. On the forty-fifth day he vomited blood, and, growing progressively weaker, died on the forty-seventh day. Several cuts representing the aneurysm and its relations illustrate the article. The aneurysm sprang from the anterior wall of the aorta in the region of the celiac axis, and connected with the aorta by an opening $1\frac{1}{2}$ inches long and $\frac{3}{4}$ of an inch wide. The sac was filled with a firm, laminated clot. The aneurysm had opened up the gastrohepatic omentum, and the lesser curvature actually formed a part of the sac. In the center of the adherent lesser curvature a round ulcer was found, about the size of a shilling, through the base of which shreds of organized clots protruded. A finger introduced through this opening came in contact with the wire. Maunsell believes that death in this case was due to the spreading of the ulcer, resulting in opening of the aneurysm rather than to a progression of the aneurysm, which it is thought was fairly on the road to recovery.

H. Kehr¹ reports an interesting case of **aneurysm of the hepatic artery treated successfully by ligation**. Of 22 cases of hepatic aneurysm reported, only 3 have been operated upon. In each a fatal issue took place. Kehr's patient was a man, 29 years of age, who presented the symptoms of cholelithiasis complicated by gastric or duodenal ulcer. The attacks of hepatic colic which he had are supposed to have been due to the formation of a clot in the cystic duct. No pulsation before operation could be felt through the abdominal wall. When the abdomen was opened, the gallbladder was aspirated and 360 cc. of dark-brown fluid was withdrawn. No gallstones could be felt, but at the neck of the gallbladder a hard, pulsating tumor could be felt. The cystic duct was then laid open, and a fibrinous blood-clot removed; severe hemorrhage followed this procedure. The gallbladder was excised, the hepatic artery exposed by carefully separating the hepatic vein and bile-duct from it. It was then divided between two ligatures, and the aneurysmal sac freely excised. The wound was drained with gauze and the patient made a satisfactory recovery, without complication, excepting a superficial necrosis of a small portion of the liver. Kehr states that although it would appear that ligation of the hepatic artery would result in extensive necrosis of the liver, as a matter of fact the collaterals become gradually dilated and no such result takes place. The diagnosis of a hepatic aneurysm is extremely difficult, but it is believed that it should be considered when the patient, in addition to jaundice and hepatic colic, also suffers from gastric hemorrhage.

Summers² (Omaha) reports a case of **varix of the inferior mesenteric vein complicated by chronic ulcerative colitis**. Numerous ulcers were observed in the rectum and sigmoid, and as the patient improved but little under irrigation, the abdomen was opened with the idea of making a right inguinal colostomy. It was discovered, however, that the inferior mesenteric vein was very much enlarged and its walls thickened. In addition, all the branches of this vein were enor-

¹ Münch. med. Woch., Oct. 27, 1903.

² Jour. Am. Med. Assoc., July 19, 1903.

mously swollen. The abdomen was closed. Two months of treatment resulted in no improvement, and Summers determined to open the abdomen again to discover whether there was any pressure upon the vein producing the condition which he discovered at the first operation. He examined especially the pancreas, but found nothing in this organ which could account for the interference with the circulation. The stomach was considerably dilated, and it was thought that possibly, by dragging, it might produce some interference with the circulation of the veins, and therefore gastroplication was done and Morrison's operation was also performed, with the hope of relieving the portal system. Great improvement followed this operation, and 2 months later an artificial valvular fistula was made in the cecum for the purpose of aiding irrigation of the large bowel. The patient gained 20 pounds in the 2 months following the operation, and his improvement continued until recently, when he allowed the fistula to close. This was followed in turn by a relapse.

W. Birch Caley¹ reports a **fatal case of pulmonary embolism following simple fracture of the leg**. The patient was progressing satisfactorily after his injury, when, 15 days after its occurrence, he suddenly was taken ill and died within 15 minutes. A postmortem examination revealed an extensive pulmonary embolism and a thrombosed femoral vein. There was no disease of the bloodvessel-wall to account for the thrombosis.

Hartmann² reports a case of **accidental wounding of the inferior vena cava while performing a nephrectomy**. The wound was 3 cm. in length, terminating about 3 cm. below the renal vein. A ligature was placed above and below the injury, and the patient made a good recovery. During the convalescence there was slight edema over the malleoli. Hartmann maintains that ligation of the vessel is indicated in these injuries unless the injury involves the region of the renal pedicle; here the ligation would interfere with the circulation of the other kidney. In such a case an attempt should be made to repair the vein by a lateral ligature.

Beutter³ reports a case of **ligation of the common carotid during the removal of a submaxillary tumor** in which a hemiplegia developed 20 minutes after the operation, while the patient was recovering from the anesthetic. The paralysis almost entirely disappeared within 2 or 3 weeks.

Höpfner⁴ presents an interesting discussion of the **suture of blood-vessels and possible restoration of amputated extremities**. He refers extensively to the literature of the subject. Hallowell, in 1759, successfully sutured an injured brachial artery, and Lembert, in 1762, demonstrated the possibility of successfully closing arterial wounds in horses. Murphy, of Chicago, reported the first successful circular suture of a great bloodvessel. He performed an anastomosis by invagination

¹ Quarterly Med. Jour., Aug., 1903.

² Bull. et Mém. de la Soc. de Chir. de Paris, 1904, No. 2.

³ Lyon méd., Dec. 27, 1903. ⁴ Arch. f. klin. Chir., 1903, vol. lxx, p. 417.

after excising a portion of the femoral artery; this was done in 1897, and in a case of gunshot injury of the artery. Payr has demonstrated the use of supporting absorbable rings of magnesium in performing circular suture of the large arteries. Höpfner details 6 experiments by this method. In 2 instances death occurred from thrombosis. In the other instances he was more or less successful. He was also able to make an interchange of sections of 2 different arteries in the same animal successfully. In each, good healing occurred and perfect function was retained. He also amputated a hind leg of 3 dogs and immediately sutured it into place again, tying the smaller vessels, anastomosing the larger ones, and suturing the nerves. In 2 instances thrombosis and gangrene resulted, but in the third the dog was in good condition, with free circulation until the eleventh day, when he died under an anesthetic, which was being administered for the purpose of making the first dressing. Höpfner speaks very encouragingly regarding what can be done in the suturing of large vessels, and also bespeaks a future for transplantation of sections of vessels.

DISEASES OF THE LYMPHATIC SYSTEM AND OF THE THYROID GLAND.

Frederick Gwyer¹ deals with the subject of **lymphatic constitution and the care of the lymphatics during and after surgical operations**, his attention being directed to the subject by the following case: A boy of 6 or 7 years of age was operated upon for a tuberculous sinus and tuberculous glands of the axilla. The sinus and a number of glands more or less broken down and resembling the usual tuberculous glands were removed. There was remarkably little bleeding during the operation, no ligatures being required. The operation was completed at about 12 o'clock noon, and the boy left the table in good condition. At 3 o'clock the next morning his temperature was 103°, his pulse rapid, and there was great restlessness, with some delirium. This condition came on gradually. There was nothing wrong apparently with the dressings or the wound. In spite of treatment the temperature rose to 105°, the delirium continued and increased, was succeeded by coma, and the patient died 24 hours after the operation. In trying to find some cause for this unusual and surprising death Gwyer came to the conclusion that there had been an infection through the lymphatics. The patient was of a lymphatic constitution, presenting the characteristic symptoms of fine, silky hair, fair complexion, large surface lymphatic glands, and enlarged tonsils and adenoids, also some anemia and the peculiarity of unusually little bleeding at the time of operation. The anesthetic was taken remarkably well. After operation there were high temperature, delirium, and rapid death. The case closely resembles one reported by Blake, except that in his case the temperature was not so high nor the delirium so marked. Gwyer admits that it is difficult to assert positively that the lymphatic constitution was the cause of this death, and

¹ Ann. of Surg., May, 1904.

yet he was so convinced of it that he has lately practised a careful technic in regard to the lymphatic vessels and spaces in all cases in which there is danger of septic infection through these structures. In removing diseased glands he dissects them to the point of exit of the vessel, and then applies a ligature. In cases of suppuration the wound down to the area of suppuration has thoroughly rubbed into it a sterilized vaselin or thick ointment, such as iodoform ointment. If this is impossible before the abscess is opened, when evacuation has been completed the cavity and the wound are filled with this material, the idea being to prevent absorption of the pus through the open lymphatic spaces. It is impossible to reach any definite conclusion regarding the results of this treatment, since the condition occurring in the case reported is so very rare. It is stated, however, that it is Gwyer's belief that the subsequent course of suppurations has been altered and the severity of symptoms lessened by this procedure.

L. L. McArthur¹ discusses **acute suppurative thyroiditis** and reports 5 cases of this condition—1 of his own and 1 each of Bevan, Andrews, Halstead, and Ferguson. A distinction is at once drawn between inflammation of a diseased thyroid and inflammation of a normal gland. It is with the latter condition that McArthur deals. There is a type of acute thyroiditis which runs a course of from 10 to 12 days, with the usual signs of inflammation, and terminates usually in resolution; it is often observed among soldiers in garrison. Suppurative or infective thyroiditis is always bacterial in origin, generally unilateral, and in most cases occurs as a complication of some other septic process, such as puerperal fever, typhoid, or pneumonia. The condition is most common between the ages of 20 and 30, and females are more frequently affected than males. Microorganisms vary with the predisposing condition—for instance, streptococci are found with puerperal fever, pneumococci with pneumonia, and typhoid bacilli with typhoid. Kummer makes a distinction between metastatic infection and hematogenous infection. In the former the culture is almost invariably pure, and in the latter often mixed. The peculiar symptoms of thyroiditis—that is, those in addition to the ordinary signs of inflammation—are as follows: (1) Great thirst, because of the difficulty in swallowing; (2) occasional severe epistaxis, from pressure to return flow; (3) nausea and vomiting from pressure on the pneumogastric; (4) hoarseness and vocal-cord paralysis; (5) dyspnea (Gresinger saw a fatal case). The temperature is usually very high. The greatest difficulty in diagnosis is encountered in differentiating this condition from a low esophageal abscess. In the early stage, while inflammation is confined to the gland, the mass will be observed to move with deglutition like a goiter, and in the early stages there is an absence of all edema or redness over the gland, whereas in esophageal abscess this appears early and becomes diffuse. As the abscess is usually unilobular, simple evacuation with drainage will result in recovery. McArthur advocates: (1) Incision and drainage—especially where the constitutional condition is low—as it can be done even

¹ Chicago Med. Recorder, Dec., 1903.

under local anesthesia, postponing the dangerous extirpation until a more propitious time; (2) then the enucleation, if there is a persistent suppurating cyst, to avoid dangers of burrowing in the direction of trachea, esophagus, or mediastinum; (3) when the process is deeply situated behind the sternum, perhaps then the better practice would be at once to remove the gland intact, as drainage cannot safely here be practised. A report of each of the 5 cases referred to concludes the article.

Henry Roth¹ reports an interesting case of **acute suppurative thyroiditis** occurring in a man 40 years of age. The patient was extremely ill upon admission to the hospital, being in a state of profound sepsis and decidedly cyanosed. The swelling was diffuse over the anterior portion of the neck, but there was no fluctuation. Swallowing was difficult. Chloroform was administered, the thyroid exposed through a median incision, the left lobe incised, and a few drops of pus evacuated. The gland showed areas of necrosis. Iodoform gauze was inserted for drainage. After the operation the patient's temperature rose to 107° and he died the following day. A careful autopsy was made and the case was shown to be one of primary suppurative thyroiditis. Such a condition is very rare. The infection was streptococcic.

B. Farquhar Curtis² presents a study of **thyroidectomy and sympathectomy for exophthalmic goiter**, closing his paper with a detailed account of 11 cases of thyroidectomy and 7 of sympathectomy. If the patient's circumstances permit the carrying-out of systematic treatment for a sufficiently long time, the employment of rest, hygienic measures, and proper medication will generally produce a cure, or at least hold the symptoms in check. Surgical treatment, however, will cure a certain number of cases which do not yield to any other treatment. Curtis reports 11 cases of thyroidectomy with 3 deaths, all due to acute thyroidism without wound complications, 6 cures, 1 improved, and 1 lost sight of. He was led to give up this operation and try sympathectomy because of the great frequency of thyroid poisoning after thyroidectomy. During the last 2 years he has removed the sympathetic ganglions in 7 cases. The results, however, have not been much better than those in which thyroidectomy was done. There were 2 deaths from acute thyroid poisoning, and one death probably due to the anesthetic. The operation was performed on both sides in one sitting except in one case. The third cervical ganglion is often confused with the first dorsal ganglion, and will have to be separated with scissors or knife after blunt dissection. This is considered the most difficult part of the operation. It is considered early to judge the results of these operations, but so far the record is 3 cases cured, 1 improved, none unimproved, and 3 died. In speaking of the treatment of acute thyroidism after operation, it is stated that there is no remedy of any specific value; morphin will quiet the restlessness, but there is no drug which will control the heart. In but one of the cases of sympathectomy did these symptoms arise. The following is a synopsis of the foregoing contribution: Exophthalmic

¹ Am. Jour. Med. Sci., Jan., 1904.

² Ann. of Surg., Aug., 1903.

goiter can be cured both by thyroidectomy and by sympathectomy. A perfect result can be expected in about 60 % of the cases of thyroidectomy. An immediately good result appears to be the rule in sympathectomy. Sufficient time has not elapsed to judge of the permanence of the cure, but the immediate results of sympathectomy are far superior to those of thyroidectomy. The relative mortality of the 2 would also seem to favor sympathectomy (Kocher, 4 deaths in 59 cases of thyroidectomy or ligature only, Jonnesco none in 14 bilateral sympathectomy); although in Curtis' cases the proportion is the opposite. There is serious danger of acute thyroidism after both operations. It is thought wise to use local cocaine anesthesia for thyroidectomy, and to give it a trial also in sympathectomy. Sympathectomy should be performed upon only one side at a time, with an interval between the operations sufficiently long to permit the patient to recover from the effect of the first operation.

The surgical treatment of goiter is briefly discussed by C. H. Mayo¹ (Rochester, Minn.), who, after describing the anatomy of the thyroid gland, deals with the various types of goiter. Parenchymatous goiter usually responds to medical treatment. Occasionally, however, the colloid material is so abundant and the alveoli so large in the long-standing parenchymatous goiters that they are called colloid cystic goiters. In parenchymatous goiter the condition which renders operation imperative is usually dyspnea. Dysphonia and dysphagia and occasionally the weight and general nuisance of a large tumor are also indications for operation. During the past 15 years the Mayos have operated in 110 cases for various forms of goiter. Of these, 34 were for exophthalmic goiter, with 6 deaths; 2 were for carcinoma, both fatal—one on the third day and one 14 months later. Seventy-one patients presented various types of adenoma and colloid cystic goiters; in this class there was one death. The collar incision of Kocher is preferred, as it gives the best exposure and the least disfigurement. This incision crosses the gland in the line of the creases of the neck, and extends on one or possibly both sides as far as the posterior border of the sternocleidomastoid muscle. Occasionally there is difficulty in determining the true capsule of the gland. This question can be decided, however, by carrying the incision into the tumor structure itself. In an exophthalmic goiter it is Mayo's rule to give $\frac{1}{4}$ or $\frac{1}{2}$ grain of morphia 20 minutes before the operation, and to anesthetize the patient with ether by the drop method. Where there is extreme dyspnea or the exophthalmos is marked, local anesthesia is employed. This method is also used when Mayo lacks confidence in the anesthetic. The after-results have been perfect in colloid and adenomatous goiters, excepting in one case, when permanent hoarseness resulted. In the malignant cases the operation was difficult, palliation short, and mortality high. The exophthalmic cases which recovered from operation were all benefited within a period of three months. About 50 % became free from exophthalmos within from 3 to 6 months; in 25 % the improvement was continuous during a year; in 25 % the improvement was partial, the exophthalmos being

¹ Jour. Am. Med. Assoc., Apr. 23, 1904.

slow to disappear. None was made worse by the operation, and those in whom death occurred suffered from the most severe type of Graves' disease. A condition of acute thyroidism is probable after operation on this gland during the first 24 or 48 hours, and seems to depend upon the amount of traumatism of the gland. This condition is more noticeable in the exophthalmic cases, and is usually accompanied by a slight rise of temperature.

T. C. Witherspoon¹ (St. Louis) reports 9 cases of **Graves' disease** in which he has operated and discusses the various treatments of this disease. He states that the operation which gives the greatest degree of satisfaction is the removal of the lobe of the gland which is most infected. Usually this is the right lobe. The capsule of the gland is usually adherent, thickened, and very vascular, and in separating it from the inclosed gland, the hemorrhage is apt to be considerable. This he avoided, however, by the ligation of the superior thyroid artery. The operation should always be performed under local anesthesia; Witherspoon uses a very weak cocaine solution and infiltrates the parts freely. Manipulation of the deeper structures is painful, but can be accomplished with little difficulty if the infiltration is made to precede the separation of the gland from its capsule. For the closure of the skin-wound it is well to infiltrate the part a second time before introducing the sutures. He does not advocate drainage, but says that drainage for 12 or 24 hours is allowable where there is much likelihood of considerable oozing. The Mikulicz operation, consisting in the excision of a portion of each lobe, is not recommended because of the greater bleeding which accompanies it. He states that a ligation of both superior thyroid arteries and a later removal of one lobe will accomplish more and is more readily performed. In Witherspoon's group of cases there was one death, which he states was undoubtedly the result of giving a general anesthetic. In the 7 cases of partial thyroidectomy which survived the operation the symptoms in all practically disappeared. Improvement was noted in all but one case within 48 hours. After the operation certain symptoms may continue for a longer or shorter time before disappearing, the most obstinate of these being the exophthalmos.

Patel² discusses the **metastases which occur in tumors of the thyroid body**. It appears to be definitely established that tumors of the thyroid that are clinically benign may give rise to metastases that are malignant as well as to those that, like the parent tumor, are benign. Microscopic examination reveals the true nature of the tumor if the clinical picture is not decisive. Metastases occur in bones or the lungs. The former involve principally the short and flat bones, as the cranium, maxilla, vertebral column, pelvis, but are also found in the long bones. The size of the goiter does not seem to influence the appearance of secondary growths; the cause lies in the tumor itself, the colloid variety most often undergoing metastasis. Treatment consists in general thyroid administration, removal of all or a part of the goiter, and removal of the

¹ Jour. Am. Med. Assoc., July 25, 1903.

² Rev. de Chir., Mar., 1904; Amer. Med., Apr. 16, 1904.

metastatic growth. If the secondary tumor possesses malignant characteristics, a radical operation is required; if it is benign, more conservative measures will suffice. Abstracts of the 18 personal and collected cases are given in concluding the paper.

Deanesly¹ reports a case of **implantation of the divided thoracic duct into the internal jugular vein**. He was operating for tuberculous glands of the neck and accidentally divided the thoracic duct, which was then inserted into the internal jugular and sutured. There was some leakage immediately after the anastomosis, but this promptly ceased and the patient made a good recovery. Deanesly believes that the dangers accompanying the division of this duct and the results have been greatly exaggerated.

Carrière² discusses **primary tuberculosis of the mesenteric glands**. Secondary tuberculosis of these glands is common in children; primary tuberculosis occurs usually in children from 3 to 10 years of age. Predisposition is a marked factor in the production of the disease. The first symptom of the condition is abdominal pain, accompanied by loss of appetite and strength, night-sweats, and emaciation. The abdomen also may become distended. Sometimes it is compressible and sometimes rigid. The enlarged glands may be palpated through the abdominal wall where this is lax. They are hard and tender, and are more prominent after the bowels have been thoroughly evacuated. Diarrhea is apt to alternate with constipation, and fat is found in the stools. This is a hopeful form of tuberculosis, however, as the glands are apt to become calcified. Occasionally, however, a cheesy gland may perforate into the abdominal cavity and cause a general peritonitis or general miliary tuberculosis.

Winslow Anderson³ (San Francisco) presents an interesting article on **elephantiasis** which is illustrated by numerous photographs taken in Samoa. These cases are said to be quite typical of those occurring in the tropics. It is generally conceded that elephantiasis is due to infection by the *Filaria sanguinis hominis*. The process of infection is as follows: **Filaria sanguinis hominis** is supposed to gain entrance into the human economy in the following way: A female mosquito—anopheles or eulex—abstracts at night a square meal from a victim of filariasis whose blood teems with embryos. Digestion of this meal consumes several days, during which some of the embryos develop in the body of the mosquito. The insect then deposits her eggs in a pool of water and usually ends her brief existence by drowning. The embryos now escape into the water, where they grow and flourish until swallowed by a human being. Once in his alimentary canal, the small worms bore through the walls, seeking their favorite habitat, the lymph-channels. After gaining the lymph-stream the filarias steer against the tide until they enter the smallest peripheral lymphatic vessels in the limbs, scrotum, labia, mammas, etc., and there form a permanent lodgment for years, in which they develop and produce their broods. Their presence sets up an irritation followed

¹ Lancet, Dec. 26, 1903.

² Zent. f. inn. Med., July 11, 1903.

³ Pacific Med. Jour., May, 1904.

by inflammation—a lymphangitis which results in occlusion of lymph-channels. The lymph-vessels below this stenosis become dilated, hypertrophied, or ruptured, and the whole region blocked and soaked with lymph fluid. In this manner not only lymphangitis and lymphadenitis are brought about, but also lymph-varix, lymphangiectasis, lymphangioma, lymph-serotum, chyluria, hematuria, phlebitis, chylocele, hydrocele—in short, elephantiasis as we now understand the disease. The disease is one of long duration, and may not shorten the life of the sufferer materially. Its treatment consists in prophylaxis—that is, in boiling and baking of all food-stuffs and drink in the tropics. Excision of the involved part in suitable cases has given good results.

A. Primrose¹ reports a most interesting case of **filariasis cured by removal of the adult worms** in an operation for lymph-serotum. The serotum was very large, and Primrose determined to excise a portion of it in order to relieve the patient of his great discomfort. In order to accomplish this the whole anterior portion of the serotum was removed, only allowing sufficient skin to cover the testicles to remain. Examination of this tissue after its removal disclosed an active adult worm 6 cm. in length. The patient made a good recovery, excepting for an attack of lymphadenitis in the neck, with the characteristic symptoms of elephantoid fever, which came on 46 days after the operation. This attack is accounted for by supposing that the immature ova had been discharged into the circulation by the parent worms during the manipulations at the time of operation. Repeated examinations after the operation failed to disclose the filarias in the blood of the patient, although they were readily found before the operation. Six and one-half months after the operation careful examinations were made of the blood, but no filarias were found. It is thought that the cure in this case resulted from the removal of the parent worms in the excised tissue.

DISEASES AND FRACTURES OF BONES.

L. B. Rawling² states that from 30 % to 40 % of cases of **fracture of the base of the skull** extend from a severe fracture of the vault, and that in over 60 % the injury is inflicted near the level of the base of the skull and is, therefore, a fracture by direct violence, the fracture passing inward across the base and splitting it in the same way as a chisel splits a board. The bursting and compression theory and the contre-coup theory are both untenable. Aran's irradiation theory with certain modifications accounts for those basic fractures which result from blows on the vertex. Separation along certain sutural lines is very common, especially in middle life, although sutural separation without any further basic lesion is of rare occurrence. The sphenoid sinus is involved in 70 % of cases, as all fractures from one middle fossa to the other pass across the sinus; all fractures from one middle to the opposite anterior fossa also involve this region; and most fractures of the anterior fossa or of the middle fossa tend to terminate in the sphenoid body. The

¹ Brit. Med. Jour., Nov. 14, 1903.

² Lancet, Apr. 9, 1904.

view that the line of fracture is usually arrested if it meets with a foramen in its course is erroneous. In a child's skull the bones of the vault are elastic and pliable, and consequently a blow may lead to a bending-in, temporary or permanent, without any actual fracture. Dense fibrous tissue also intervenes between the bones, tending to limit the fracture to the bone struck, extensions to the basic regions being comparatively rare. The diploic tissue is practically absent, and fractures of the internal or external tables only are almost unknown. The air-sinuses are nonexistent or small. The greater adherence of the dura mater in the child prevents the formation of any extensive extradural clot. Bruising and superficial laceration of the brain are, however, relatively more common in children than in adults. The mortality of fractures of the base is from 32 % to 70 %, and of fractures of the vault, from 20 % to 25 %. Hemorrhage from the middle meningeal artery is much more common than is generally supposed, the lighter forms yielding no symptoms, and the fissures running across the tegmen tympani are usually of such a nature that blood can be forced through them into the middle ear. Profuse and continuous hemorrhage from the ear is very suggestive of an accompanying extradural hemorrhage. The closure of the external meatus with a plug of gauze is bad treatment in these cases, as it stops drainage. In orbital aneurysm resulting from a blow on the head the fracture line travels along the anterior border of the petrous bone to the cavernous sinus, injuring the internal carotid artery as it runs forward along the outward part of the cavernous sinus. An extradural hemorrhage was found in 30 % of all cases in which a postmortem examination was held, and a previous diagnosis was made in 9 % only. Discharge of cerebrospinal fluid from the ear and nose is not common, and watery fluid may escape in considerable quantities without the existence of a basic fracture. The fluid is almost certainly cerebrospinal in nature if the discharge begins within 24 hours of the accident; if the discharge is colorless and profuse; if the discharge continues for some days, and if it contains a reducing substance. The great majority of fractures involving the anterior fossa injure the olfactory bulb or its branches. Injury to the optic nerve is exceedingly rare. The third and fourth and branches of the fifth nerves are occasionally injured in their orbital course. The sixth nerve is often injured, as it grooves the dorsum epiphii. Facial paralysis, partial or complete, existed in 24 out of 60 cases of fracture of the base of the skull. The auditory nerve is also frequently injured. In basic fractures pointing to a fatal termination the cerebellar fossa should be trephined as low down as possible and a drainage-tube inserted.

Geo. Wilkinson¹ says that by the use of plaster-of-paris in fractures of the leg the term of the patient's confinement to bed is much shortened and he suffers less in health and spirits in consequence. In order to obviate its disadvantages Wilkinson uses splints made of many layers of ordinary gauze bandage material, into the meshes of which dry plaster is rubbed (Fig. 21). The sound leg is laid on

¹ Quarterly Med. Jour., Aug. 3, 1903.

a sheet of paper and a pattern is made by cutting around it with a pair of scissors. It should extend from the root of the toes, under the heel, and up to just below the knee. It should be wide enough to embrace about two-thirds of the circumference of the limb. A good width should be allowed at the ankle to accommodate the projection of the heel. The pattern must be turned over so as to reverse the sides in cutting the splint from the pattern. The pattern of the anterior splint is simply a strip 3 or 4 inches wide and long enough to reach from the root of the toes to the tubercle of the tibia. Each splint should consist of from 10 to 12 layers of gauze cut out to the shape of the pattern. The posterior splint is now laid on a wider piece of gauze, and the whole fastened by a stitch running down the middle. Dry plaster should be rubbed in between the layers of gauze. The extra width of the outside layer should be split into tails on each side of the splint. The best position for reducing any displacement of fragments in fractures of bones of the leg is with the knee flexed to a right angle, thus relaxing the gastrocnemius. With the knee flexed the leg is laid on a box or other support. A clove-hitch of calico bandage should be fastened to the thigh just above the knee, and the bandage fastened around the head of the bed. Countertraction is made in the axis of the leg. The anterior splint is placed along the front of the leg, and the posterior is placed in position under the leg. The surgeon grasps the heel and foot through the posterior splint, and makes traction in the axis of the leg, keeping the foot in the correct position—*i. e.*, at right angles to the leg, the inside of the great toe in a line with the internal malleolus and the inner edge of the patella. The posterior splint is now fixed in position by tying the tails over the anterior splint. Traction is maintained until the plaster has set. The advantages claimed for this form of plaster case are: "1. It is applicable to all cases of fracture of the leg, with the exception of certain cases of compound fracture. 2. Its method of application is simple. 3. It is rigid and durable. 4. It can readily be cut up without disturbing the limb, and reapplied without loss of rigidity. 5. It is put on with the limb in the most favorable position for reduction of the displacement—*i. e.*, with knee and gastrocnemius relaxed. 6. The position of the leg is not shifted, and traction in axis of the limb is kept up during the whole time of application of the splints. Consequently there is a fair certainty of the fragments being fixed in good position."

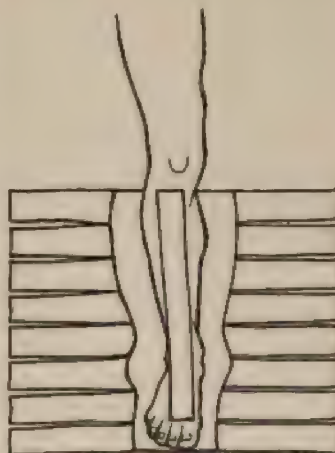


Fig. 21.—Wilkinson's splint (Quarterly Med. Jour., Aug. 3, 1903).

D. N. Eisendrath,¹ in speaking of early **massage and passive mo-**

¹ Chicago Med. Recorder, Dec., 1903.

tion in the treatment of fractures and sprains, says that when it is impossible to have a professional masseur, the physician can carry out the treatment himself, if he will remember that the massage to be preferred is that of rubbing the limb principally with the thumb and fingertips of one or both hands toward the axilla in the arm, and toward the groin in the lower extremities. Vigorous kneading or slapping of the limb is to be avoided. The previous use of hot applications for 5 or 10 minutes will render the massage less painful. The rubbings at first should be very light, and last only 3 to 5 minutes. Later on they can be a little more vigorous and the sitting can be lengthened to 10 minutes daily. The active and passive movements of the limb can be carried out immediately after the massage, but should be permitted only for a period of 5 minutes at first, and the time then gradually increased. In fractures of the elbow the right-angled plaster splint is employed; this is removed once a week and the arm gently massaged. Passive motion should not, however, be begun until union is quite firm—*i. e.*, fourth to sixth week. The contraindications to the use of early massage are: 1. Tendency to displacement of fragments in fractures. Under such conditions it is best not to begin either massage or movements until the union is firm (fourth to fifth week). 2. In compound fractures until the wound is healed. 3. Wherever the condition of the skin is such as to permit of infection; for example, the presence of blebs or extensive abrasions. 4. The presence of fragments which project but do not penetrate the skin.

Under the head of some points in the diagnosis and treatment of certain neglected minor surgical lesions, Codman¹ discusses a number of the more or less unusual injuries about joints. His first reference is to fractures of the carpal scaphoid bone. This is an injury which is frequently undiagnosed and treated as a sprain. He has been able to collect 15 cases of this injury at the Massachusetts General Hospital, and has x-ray plates of 25 other cases. In this fracture there is no deformity, no ecchymosis, no crepitus, no abnormal mobility; there are present localized swelling and tenderness in the region of the scaphoid—that is, in the radial side of the wrist-joint. There is limitation of joint-motion, and sharp pain exists on efforts at forced passive motion. The diagnosis must be confirmed by the röntgen ray. The view which best shows the deformity is an anteroposterior one with the hand in adduction. In most of these cases union does not take place, and when it does, the bony callus is sufficient to destroy the contour of the bone. The treatment should consist in fixation of the part for at least 3 weeks. Codman believes that the reason union does not take place in these fractures frequently is because the space between the fragments is filled with synovial fluid from the wrist-joint or perhaps a portion of the synovial membrane. If the ultimate result is so bad as to interfere with the occupation of the individual, Codman believes that it would be good practice to remove one fragment of the bone. This has been done in 2 cases of compound dislocation of the wrist where

¹ Boston M. and S. Jour., Apr. 7, 1904.

this bone was broken, and the results were very satisfactory. Accompanying the fracture of the scaphoid there is frequently a dislocation of the semilunar bone. In one such case Codman was able, by manipulation, to reduce the dislocation; in another case he was obliged to cut down upon the bone before he could reduce it. The results in both cases were nearly perfect. The method of reduction of the semilunar bone is to extend the wrist forcibly; an assistant then makes pressure with his two thumbs over the flexor tendons of the wrist on the semilunar bone, while the surgeon, with the assistant's thumbs still in position, flexes the wrist completely. The os magnum slips over the posterior horn of the semilunar and the latter pops into its position on the radius. Early tuberculosis of the wrist-joint may be mistaken for fracture of the scaphoid, since this condition is sometimes found confined to the region of the scaphoid. In the diagnosis the absence of history of injury, the slow onset, the extreme grade of spasm of the muscles, and local heat are important aids. The röntgen rays constitute the decisive test. Codman states that he has never known syphilis to affect the wrist-joint except in one case, and this was Charcot's disease. Occasionally tenosynovitis of the tendons of the thumb and long extensors of the wrist may simulate fracture of the scaphoid. Another point of interest mentioned by Codman is the fact that in practically all fractures of the lower end of the radius bleeding is apt to take place in the common bursa of the radial extensors. So true is this that when this bursa is found enlarged and fluctuating after an injury to the wrist, Codman feels almost certain that a fracture of the lower end of the radius exists, even in the absence of other symptoms. The röntgen ray has confirmed this belief. **Fractures about the shoulder-joint** were often overlooked until the röntgen ray showed their frequency. One of the most common of these is fracture of one of the tuberosities of the humerus. Fracture of the greater tuberosity separates a lamina from the head of the bone. Fracture of the lesser tuberosity is difficult to indicate with the x-ray because the facets pulled off by the subscapularis muscle fall in the shadow of the remainder of the bone. Codman lays great stress upon the importance of ecchymosis as a sign after injury about a joint, and believes it indicates in most instances that a fracture of some degree has taken place. He calls particular attention to inflammation of the **bursas about the shoulder-joint**, and strongly recommends the study of these bursas. One of the most important bursas is that lying underneath the deltoid muscle, extending between the acromion process and the capsule of the joint. The trapezoid bursa lying over the small triangular area at the posterior end of the spine of the scapula, the coracoid bursa, lying under the tip of the coracoid process, and the bursa between the tendons of the coracobrachialis and the subscapularis, frequently become inflamed and the condition is easily diagnosticated if the existence of the bursas is borne in mind. The trapezoid bursa is particularly apt to be inflamed if the shoulder-joint is fixed from disease or injury. If the shoulder-joint is fixed, the scapula is obliged to take part in all the motions of the arm,

and the bursa over the posterior edge of the scapula does more than its normal share of work. Codman has found that simply pinning the coat-sleeve to the coat is a very effective form of treatment in the milder cases of injury of the shoulder-joint. This allows a certain amount of rotation of the joint-cavity and free use of the forearm, but restricts the motion of the upper arm. In discussing injuries about the ankle-joint it is shown that the röntgen rays have indicated **fracture of the os calcis** in many instances in which it was not suspected. The fracture in each of these cases was impacted. The salient points for diagnosis in this lesion are: 1. The history of a fall on the feet or heels. 2. Tenderness over the os calcis. 3. Ecchymosis just above the sole on both sides of the foot. 4. Shortening of the distances between the malleoli and the floor as compared to the other foot. 5. No crepitus, abnormal mobility, or obvious deformity. The injury frequently leads to considerable incapacity, one of its results being a flat foot. The treatment should consist in keeping the patient off the foot. After the acute symptoms have subsided and the patient commences to walk, he should wear a flat-foot plate to prevent increasing pronation of the foot. Perhaps the commonest fracture about the ankle to pass undiscovered is oblique fissure of the external malleolus. In this also the characteristic symptoms of fracture are wanting and a diagnosis must be made from the existence of local tenderness, ecchymosis, and the x-ray findings. The ecchymosis takes the form of a bloody sac, which falls over the top of the external malleolus and spreads along the outer side of the foot. Another form of break which the röntgen rays have taught us to recognize is fracture of the posterior facets of the astragalus and of the facets for insertion of the lateral ligaments of the ankle-joint.

James P. Warbasse¹ contributes a paper on the **treatment of fractures**. He contends that general anesthesia is too little employed as an aid to diagnosis and for the reduction of deformity. Tenotomy and the subcutaneous division of muscle are necessary only when muscle or nerve is irritated by displaced fragments of bone or by other material. Normally the muscles lying along the bone are long enough to permit of the reduction of any fracture. Irritation causes them to retract and prevents reduction. When the fracture has been perfectly reduced, irritation is overcome so far as the bone-fragments go, but is continued by the presence of blood and exudate and is necessarily present to some extent in all cases. Among the methods employed for lessening this irritation are the use of sedative drugs, compression of the artery supplying the limb, or anemia produced by the Esmarch bandage. The injection or the infiltration with cocaine of the nerve-trunk supplying the contracted muscles is often of value. Stimpson's method of tiring out contracted muscles by continuous extension cannot be recommended. An important obstacle to reduction which is often mistaken for muscular resistance is the interposition between the bone-fragments of muscle, clot, periosteal tissue, fascia, or loose fragments of bone. When a satisfactory reduction cannot be effected because of these things, opera-

¹ Brooklyn Med. Jour., Mar., 1904.

tion is demanded. Warbasse does not hesitate to apply a plaster bandage to a fracture of both bones of the leg immediately after the accident, and before any swelling has developed. Most plaster casts are too thick. The best materials for rendering a plaster splint waterproof are copal varnish and water glass. Persistent pain after the application of a cast indicates that there is something wrong. In the treatment of fracture of the thigh the adhesive material for extension usually employed is too narrow. A good plan is to use a strip about 5 inches wide, which is cut into obliquely in such a manner as to give the effect of a series of straps diverging from a central strip. Or each strip may be divided into 3 longitudinal strips, the middle one of which is applied parallel with the leg and the other 2 obliquely. In the adult the weight required is from 15 to 40 pounds, and in the child of 10 years from 10 to 25 pounds. A common error is the employment of too little weight. The time to apply the maximum weight is immediately. An additional 5 pounds on the first day will do what 10 pounds will fail to do 5 days later. The use of the Thomas knee-splint and of the Thomas hip-splint in the treatment of fractures of the lower extremity is regarded as valuable in cases in which it is desirable that the patient should be up and about. In the treatment of fractures of the thigh in children perpendicular extension of the leg is of great value. In fractures of the thigh in the newborn the thigh should be strongly flexed upon the abdomen, and be held there by an adhesive strap and bandage. In most fractures more harm is done by anxiety to secure firm bony union than by too early employment of passive motions. When any splint is required in Colles' fracture, it should be left on only long enough for the fragments to become agglutinated, and motion of the tendons of the forearm should be obtained daily after the first few days.

Stewart Leroy McCurdy¹ describes his practice in the **wiring of bone for fractures**. He wires the bone while the ends remain in their normal position, thus preserving the soft tissues, preventing necrosis, and guaranteeing union. The ends of the bone are not sawed off unless the ends overlap or are uneven. When they are soft, they can be removed with a chisel. When a saw is necessary, the Gigli wire saw is the best instrument. To protect the sides of the wound shoe-horn retractors are better than the instruments usually employed, since they are concave and permit more freedom for the saw. The drill is passed through the external surface of the bone, $\frac{1}{4}$ inch from the end, obliquely through to the medullary margin. Two wires are used instead of one. The first is carried as far around on one side of the bone as the tissues will permit, and the second around on the opposite side. Iron wire instead of silver is employed, as it is not affected by the tissues and is sufficiently strong to permit of the twisting necessary to draw the bones together. In every instance in which silver wire was used it came to the surface and required removal. McCurdy also describes a method of anchoring bony fragments to external bridge work to hold them in position during repair, and presents an instrument used to cut the ends of the bone before wiring.

¹ N. Y. Med. Jour., Apr. 9, 1904.

S. H. Watts¹ reports a case of ununited fracture of the femur in which the bones were mortised stepwise, care being taken to preserve as much periosteum as possible, and a silver belt inserted in an anteroposterior direction, as shown in the accompanying diagram (Fig. 22). [Dr. Oscar H. Allis carried out a similar procedure a number of years ago.]

Gwilym G. Davis² delivered the annual address, entitled the **treatment of fractures**, before the Philadelphia Academy of Surgery, Jan. 4, 1904. The temptation to devote all attention to the operative cases and to leave the fractures to the care of assistants should be guarded against. Antisepsis, the röntgen rays, and the frequent use of operative measures constitute the principal advances in the treatment of fractures. Davis does not envelop recent fractures in plaster-of-paris and allow them to remain until union is firm, but assures himself, by direct inspection once or twice a week, that the fragments are in proper position. For this reason, during the first 10 days, some form of splint is always used. If a plaster dressing is used, it should be employed in conjunction with examinations by the röntgen rays. The use of soda silicate is not so common as it should be. It makes a light, firm bandage and

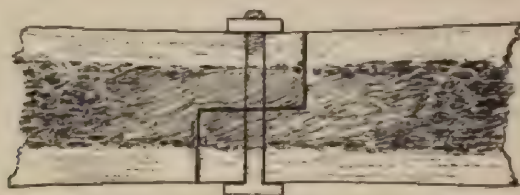


Fig. 22.—Watts' case of ununited fracture of the femur in which the bones were mortised stepwise and a silver belt inserted in an anteroposterior direction (Johns Hopkins Hosp. Bull., Apr., 1904).

is cleaner and more available than plaster. The use of starch is also worth remembering, as it prevents the slipping of the bandages. Operations may be performed by the experienced surgeon in a hospital that should not be done in a private house by one who operates occasionally. We do not operate on simple fractures with sufficient frequency. Among fractures which require operation oftener are fractures of the neck of the femur in people under 55 years of age; fractures of the upper third of the femur; and fractures of the patella and olecranon with wide separation. In some fractures of the leg division of the tendo Achillis by a tenotome is very useful. In fractures of the clavicle wiring is not dangerous. In fractures of the elbow in which ankylosis is unavoidable resection will give a movable joint and a much better result. Too often the pains of neuritis are attributed to broken bones, and paralyses are allowed to exist until firm union has occurred. Callus-formation is due very largely to displacement of bone, and is evidence that accurate approximation has not been secured. The exact approximation of the fragments in fractures of the base of the skull is the reason why callus

¹ Johns Hopkins Hosp. Bull., Apr., 1904.

² Ann. of Surg., May, 1904.

is lacking there. In fractures involving joints in which fragments of bone are twisted out of their normal position, interfering with motion, passive movements are often useless for securing good function; these cases should be recognized by the röntgen ray and the fragments fastened in place by operative measures. Passive motion for overcoming limitation of movements in joints is practically useless. If the fragments are in good approximation and the joint is kept quiet, the inflammatory effusion and callus are kept at their minimum, and the joint soon limbers up when restraint is removed. Massage is not employed as much as it should be. The use of splints is not incompatible with massage. In many cases massage should be commenced as soon as the fracture is seen; if massage gives pain, it is either unskillfully administered or is unsuitable to that case. Massage should be given twice a week in some cases and in others it should be given daily. Lint moistened with equal parts of glycerin and water makes a comfortable dressing for fractures. No impervious covering should be employed. Ambulatory dressings for fractures of the leg should be used only in those cases in which it is impossible to retain the patient in bed. When the thigh is involved, the method is undesirable.

F. F. Burghard¹ writes on the **modern treatment of fractures**. The röntgen rays and general anesthesia should be employed, with few exceptions, in the treatment of fractures. Greenstick fractures in very young children may not be made manifest by the x-rays. The most important improvement that has been introduced in recent years is the use of massage and early passive motion. Massage hastens the absorption of extravasated blood and prevents muscular atrophy. Passive movements prevent torn muscular or tendinous structures from becoming adherent to the seat of fracture, to one another, or to the tendon-sheaths. In dislocations the old plan was to immobilize the limb for a considerable time in order to allow the torn ligaments to unite. The real factor, however, in keeping the joint-surfaces in apposition is not so much the capsule, but the muscles surrounding the joint. Immobilization of a joint sufficiently long for union of the capsule will be followed by adhesions within the joint and atrophy of the muscles around the joint. Massage, passive motions, and even active motions, will prevent muscular atrophy and intraarticular adhesions. For fractures of the clavicle Burghard uses the figure-of-eight bandage to pull the shoulders well back, and places the elbow in a large sling. Gentle massage is made over the seat of the fracture from the neck to the point of the shoulder. The massage should last 5 or 10 minutes in the first instance, and should be repeated twice daily for the first few days. In 3 or 4 days the sling may be dispensed with at times, and underhand movements should be encouraged. The massage is used for a week or 10 days, gradually increasing in frequency and duration, and at the end of that time all restraining apparatus except possibly a wrist-sling may be dispensed with. Overhand movements should be attempted at the end of 2 weeks and gradually increased in range and direction. The disability after a Colles' fracture

¹ Lancet, Dec. 19, 1903.

depends not so much upon irregularity of the fractured surfaces or upon bad coaptation as upon adhesions in and around the wrist-joint. Massage over the seat of fracture applied to the dorsal aspect of the limb should be used from the time the limb is put on a splint, and active and passive movements of the fingers should be practised. Before the end of the first week passive movement should be made in the wrist. In Pott's fracture manipulation usually suffices to correct the displacement if the knee and thigh are fully flexed to relax the tendo Achillis. The best plan is to put the limb upon an external lateral splint with the foot-piece at right angles, and to let it lie upon its outer side with the knee flexed. This has the advantage of leaving a great portion of the limb exposed for massage. A back splint is not used because the displacement is primarily lateral and not posterior. Massage is begun on the first and passive movement of the toes on the second day. It is of importance to prevent stiffness in the ankle or pointing of the toes, and hence passive movement of the ankle should be begun within 3 or 4 days of the injury. Passive movements should be persisted in for from 10 to 14 days, when the patient may discard his splint or wear a light poroplastic or millboard splint molded to the outer aspect of the limb.

Andrew B. Ross¹ reports a case of depressed fracture of the skull caused during birth by forceps. The depression occupied the left frontal bone and measured 2 inches in diameter. Compression in the diameter of the head at right angles to that in which the depression lay failed to effect reduction of the fracture. Twenty days after birth an incision was made into the scalp and the depression was elevated by means of a raspatory. Recovery followed.

Charles A. Aldrich² reports a case of epilepsy the result of fracture of the base of the skull. A search of the literature reveals but one other well-authenticated case. The cause of this infrequency is probably owing to the fact that when the base is fractured, the contiguous brain lesions are in structures the injury of which is not liable to result in convulsive disease.

Wm. Fuller³ concludes a paper on the treatment of fractures of the lower jaw as follows: "1. When the teeth are present and the aid of a competent dentist is to be had, the wiring of bone-fragments in any but the most exceptional cases of lower jaw fracture is not only needless and unwarranted, but dangerous surgery. 2. The splint will more accurately and firmly hold the fracture than any other device. 3. It is unnecessary to extract a tooth or make other provision for feeding the patient, as any quantity of fluids can be taken with the splint in position. 4. It can, with very little trouble, be removed, cleaned, and replaced, should occasion demand it, and, as stated by Ottolengui, it is not, when in position, unattractive. 5. It is cheap, and can be made and used in all cases without much expense to either surgeon or patient."

S. L. McCurdy,⁴ in a paper on the treatment of fracture of the mandible, says the Barton bandage does not hold the fragments in

¹ Brit. Med. Jour., Apr. 16, 1904.

² Chicago Med. Recorder, Mar. 15, 1904.

³ Med. News, May 21, 1904.

⁴ Ann. of Surg., Nov., 1903.

position. When the interdental splint is used, the mouth becomes filthy and the splint does not furnish any mechanic force to hold the bones in position, but tends rather to throw the fragments out of angle, and is not so good a splint as are the upper teeth themselves. All devices which have as their anchorage the normal teeth are unstable even when sound teeth are present, and are impracticable devices when the teeth are not conveniently located. McCurdy drills a hole through the mandible between the apexes of the second and third teeth from the line of fracture, so as to form a firm anchorage for the wires. He uses iron wire, since it is tougher and less irritating than silver wire.

Latarjet and Gazet¹ report 2 cases of **fracture of the upper end of the radius in adults**, and have collected in all 9 such cases. Experimentally this injury may be produced by a force acting perpendicularly to or parallel to the axis of the radius, and by torsion or muscular action. In the cadaver powerful twists of the forearm would produce a fracture of the ulna, but no injury to the radius, so that torsion as a cause is rare in adults, although common in children. In one of the reported cases the injury was caused by sudden violent contraction of the biceps. The diagnosis is often difficult to make. Slight discoloration and acute localized tenderness are often the only signs. In some cases resection of the head of the radius may be necessary to secure supination and pronation.

V. Kenerson² describes a **method for the reduction of Colles' fracture**. The patient is placed in a chair with the hand extended in front, the plane of the hand being perpendicular to the floor. A skein of yarn is looped over the wrist and fixed to a post or door-jamb by means of a staple. The surgeon makes countertraction on the forearm with one hand while with the other hand he presses the fragments into place. By this method the patient cannot interfere with the manipulations, an anesthetic is not necessary, all details can be attended to by the surgeon alone, and it meets every anatomic requirement.

Fred T. Murphy³ reports 2 cases of **pneumothorax associated with fracture of the ribs**. In the Massachusetts General Hospital records for 20 years there are but 2 cases noted. In these cases, when dyspnea is only moderate, treatment consists in the administration of morphin and immobilization of the chest-wall to control forced expiration, which is the cause of the condition. If the collapse of the lung becomes alarming, puncture of the chest-wall and possibly aspiration are indicated. A contraindication to either procedure is the danger of reopening the partially agglutinated wound of the lung. After the recovery from collapse the lung returns to its normal position within a comparatively short time. [In the Jefferson Hospital a similar case was recently treated. The patient was a fireman who fell from a roof and fractured the sixth and seventh ribs of the left side. He recovered, but the lung expanded only to one-half its normal size and remains adherent to the chest-wall.]

¹ Lyon méd., Sept. 13, 1903.

²N. Y. Med. Jour., June 4, 1904.

³Boston M. and S. Jour., Oct. 29, 1903.

L. B. Scott¹ reports a case of **fracture of the odontoid process of the axis with fracture of the atlas**. The patient was a man, aged 23, who received a blow with a heavy stick on the back of the neck. He fell forward to the ground and sustained a double Colles' fracture, the left being compound. Nine days later he died of tetanus. There had been no symptoms referable to the spinal cord, and the vertebral injury was discovered only at necropsy.

Royal Whitman² describes a new treatment for **fracture of the neck of the femur**. The limb is drawn upon to overcome shortening, and is slowly abducted until the trochanter is apposed to the side of the pelvis, the trochanter at the same time being pressed downward and inward. With the limb in this position a plaster spica is then applied from the



Fig. 23.—Fracture of the capitellum. X shows loose fragment in front of the external condyle. Y shows, apparently, the gap from which the fragment came (Cotton and Sylvester, in Boston M. and S. Jour., Dec. 31, 1903).

mammary line to the toes. This method is claimed to reduce the fracture more accurately and to give better results.

F. J. Cotton and C. P. Sylvester³ report a case of **fracture of the capitellum in a patient aged 40 and a fracture of the fifth metatarsal bone by inversion in a patient aged 45** (Figs. 23, 24).

E. Elliott, Jr.,⁴ in a paper on **fracture of the patella**, concludes: "1. Owing to the not infrequent uncontrollable rotation of the lower fragment, through an arc of 90° on its horizontal axis, accurate apposition of the fractured surfaces cannot always be secured, and under these circum-

¹ Brit. Med. Jour., Jan. 30, 1904.

³ Boston M. and S. Jour., Dec. 31, 1903.

² Med. Rec., Mar. 19, 1904.

⁴ Med. News, June 11, 1904.

stances the ultimate result of conservative treatment could scarcely prove satisfactory. 2. Suitable apposition may also be prevented by the interposition of torn shreds of capsule, by extravasated blood-clot, and possibly also by the interposition of untorn periosteum, conditions which can be recognized and remedied only by exploration. 3. Suture of the fragments permits of simultaneous suture of the torn capsule, a procedure of the greatest importance for restoration of joint security. 4. The results of suture are almost invariably excellent, and the risk of operation is comparatively slight. 5. Finally, there is in no way a desire to belittle the risk of operation. On the contrary, the exercise of the most rigid aseptic precautions both in the preparations for and in the carrying-out of the operation itself cannot be too greatly emphasized. Far better, in any instance, where for any reason the highest degree of surgical asepsis cannot be practised, to advise some nonoperative procedure than to subject the patient to the possibility of a septic arthritis with all its direful consequences."

S. C. Plummer¹ gives the present status of the question of treatment of simple transverse fracture of the patella as follows: "1. Operative treatment should never be undertaken except under the best of conditions for maintaining asepsis. 2. Presupposing ideal aseptic conditions, not every case should be subjected to operation, but only those in healthy patients of suitable age, with at least half an inch of separation of the fragments, and lateral tears which compromise the 'reserve extension apparatus,' or in patients following arduous occupations. 3. The operative treatment fulfils all the indications for treatment in a manner which the nonoperative method can only partially achieve, but good functional results follow the nonoperative treatment as a rule. 4. Early massage in all cases favors the early and complete restoration of function of the joint, and should be used in all cases. 5. If operative treatment is employed, the open arthrotomy should be used. 6. Absorbable suture material applied to the soft parts is sufficient in nearly every case."

T. Fiaschi² describes Ferraresi's tenoplasty for fracture of the

¹ *Medicine*, Jan., 1904.

² *Austral. Med. Gaz.*, Aug. 20, 1903.



Fig. 24.—Oblique fracture of fifth metatarsal bone, from inversion of the foot (Cotton and Sylvester in *Boston M. and S. Jour.*, Dec. 31, 1903).

patella. A longitudinal incision is made over the lower part of the thigh and patella. A tendinous flap attached to the upper part of the patella and the size of the patella is dissected from the quadriceps femoris and reflected down over the patella and sutured in place (Fig. 25). Eleven successful cases are reported. This tenoplastic method has also been adopted for fracture of the olecranon.

John T. Bottomley¹ reports a case of **acute nontraumatic multiple osteomyelitis** occurring in a man aged 43 years. He had been troubled with an obscure pulmonary inflammation for a number of years. The left humerus, the left fibula, the right ulna, and the right tibia and fibula were successively involved in the process within a month. Death followed. The infecting organism was the streptococcus. But one similar case occurring in an adult could be found in the literature.

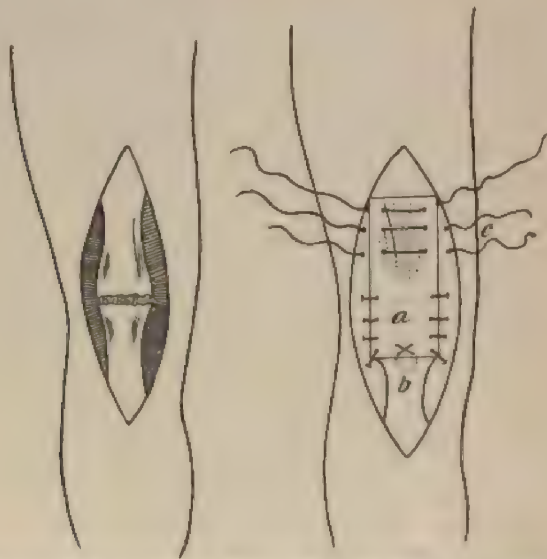


Fig. 25.—Ferraresi's tenoplasty for fracture of the patella. *a*, Tendinous flap dissected from quadriceps extensor femoris, and folded down over fractured patella; *b*, looped suture attaching free edge of flap to ligamentum patellae; *c*, sutures bringing together edges of gap left in the tendon of quadriceps (Fiaschi, in Austral. Med. Gaz., Aug. 20, 1903).

Edward H. Nichols² concludes a lengthy paper on **infectious osteomyelitis** as follows: "1. In the acute stage of osteomyelitis drainage of abscess in the soft parts alone is not sufficient. The bone-marrow is infected and must be drained. Removal of a sufficient amount of cortical bone alone is all that is required to give perfect drainage to the bone-marrow. Curettage and disturbance of the marrow cause extensive destruction of the endosteum, which, if left alone, has in a limited number of cases, operated on early, sufficient power of regeneration to repair the bony defect without the formation of a sequestrum. Under those

¹ Jour. Am. Med. Assoc., Jan. 25, 1903.

² Jour. Am. Med. Assoc., Feb. 13, 1904.

circumstances a very early operation on the cases is necessary. 2. In the subacute stage it is desirable to remove the necrotic shaft, completely or partially, at an early stage in order to take advantage of the power of regeneration of the periosteum. The periosteum either before or after the beginning of periosteal ossification has the power of regenerating a completely or partially removed shaft of bone. 3. For mechanic reasons the manipulation of the periosteum is easier after ossification of the periosteum has begun, but while the membrane still is plastic. Moreover, the rapidity and surety of perfect regeneration seem greater at that time. 4. The operation consists of an incision through skin and ossified periosteum down to necrotic shaft, reflection of the periosteum, removal of the shaft, either entire or partial, folding of the plastic periosteum in such a way as to approximate the internal layers, suture of the edges by absorbable sutures, suture of the soft tissues, with, in both cases, provision for moderate drainage and complete immobilization. 5. The success of the operation is naturally greater when asepsis is provided for by careful drainage preceding the operation and by careful removal of all infected material and tissues at the time of operation. 6. After removal of the necrotic shaft well-marked ossification of the new periosteal shaft appears between the twentieth and fortieth days, and the shaft is solid enough for use in locomotion in from 4 to 8 months. If the epiphyseal line is extensively destroyed, considerable shortening of the limb may result. 7. The regenerating bone at first becomes much larger than the original shaft was, and is entirely composed of solid periosteal bone, with no marrow-canal. This enlargement probably is due to the fact that the bone is less completely calcified than it is later. In time the size of the bone decreases almost or quite to that of the original shaft, and, finally, judging from x-ray photographs, a marrow-canal is formed. This fact suggests that the size of bones may be due to two factors,—heredity and environment,—and that the ultimate size of the bone, therefore, is due to the function required of it. 8. The chief difficulty in completing the restoration of the shaft is to obtain complete union of the regenerated shaft to the epiphyseal line or to the portion of the normal shaft that remains. Slight necrosis and suppuration may persist at this point after the repair otherwise is complete, and may demand minor operations to remove small fragments of necrotic bone. Union at these points may be delayed, but ultimately always has taken place. 9. The best time for the operation ordinarily is about 2 months after complete drainage of the acute infection. 10. This operation is the operation of preference, and is especially applicable when an accessory bone which can act as a splint is present. 11. The anatomic, functional, and cosmetic results obtained by this operation are much superior to those obtained in any other way in cases of large bony defects due to acute infection of the bone. 12. When no accessory splint bone is present, it may be impossible, in special cases, to maintain the contour of the affected bone by the above-mentioned method. In such cases advantage can be taken of the power of central growth possessed by the shell of periosteal bone in its early stages. This means that the necrotic

bone must be removed just as soon as the periosteal shell is sufficiently advanced and solid to maintain contour and bear the weight of the limb. Roughly, this stage is reached when the thickness of the periosteal shell is equal to one-quarter of the diameter of the original shaft. 13. The time when this condition exists can be determined by röntgen-ray examination and by palpation. 14. If the necrotic shaft is removed at this time, it leaves a solid cylinder of periosteal bone, very vascular, but partly calcified, analogous to the bone seen in an early external callus, and this shell has sufficient power of central growth to fill up large cavities. The rate of central growth seems to be markedly slower than that of peripheral growth. Persistence of sinuses is longer than in the preceding method, partly from a delay of closure of the cavity, and possibly from a failure to remove small fragments of necrotic bone at the time of operation. 15. This method of operating leaves at first bone very much larger than the original bone, but, as in the preceding case, ultimately the bone diminishes in size and slowly approximates that of the original bone. 16. In the chronic cases more or less sequestrum surrounded by an enormously thick shell of dense, cortical, more or less ivory-like bone exists. 17. The power of repair of dense cortical bone is very slight or practically wanting. Removal of sequestrums leaves a more or less extensive cavity in the bone, surrounded by a wall of dense bone, lined with unhealthy granulations, which has no tendency to close. 18. The most satisfactory methods ordinarily recommended for the closure of such defects are the aseptic blood-clot, or obliteration of the cavity and approximation of skin-flaps. The aseptic blood-clot aims to fill the defect with dense scar tissue, but does not lead to regeneration of bone, and requires for its success greater asepsis than ordinarily can be obtained in extensive osteomyelitis. The skin-flap method may close the cavity, but does so at the expense of great bony destruction. 19. From one semisuccessful case, from a consideration of the general process of regeneration of bone by the periosteum, and the successful results obtained in the subacute cases, it seems likely that better results can be obtained by removal of both sequestrum and involucrum and the use of the regenerative power of the periosteum. 20. In removing a portion of a shaft under such circumstances the excision should be carried sufficiently far into the normal shaft to get above a medullary canal, occluded by dense, ivory bone, and reach vascular marrow. 21. Finally, the most satisfactory results in treatment of acute osteomyelitis can be obtained by complete drainage of soft tissues and marrow in the acute stage, with the removal of extensive necroses, if they occur, at a secondary operation undertaken about 2 months later, and by adaptation of the regenerative power of the periosteum for the formation of a new shaft."

W. F. Cholmeley¹ reports a case of **hydatid disease of the femur** necessitating amputation at the hip-joint. The patient was a woman, aged 30, who came under observation for fracture of the femur.

J. R. Montgomery² reports a case of **osteomalacia**. The condition

¹ Brit. Med. Jour., Mar. 5, 1904. ² Jour. Am. Med. Assoc., Aug. 8, 1903.

took 3 years in development, during which time the patient, a woman, sustained 2 fractures of the right femur and one of the left humerus. The patient became demented and greatly emaciated. The bodies of the last 3 or 4 cervical and of nearly all the dorsal vertebrae apparently disappeared. The pelvis was a shapeless mass. The femurs had apparently been absorbed. Her height had decreased from 64 inches to 42. (See Fig. 26.)

Mark C. Lidwill¹ reports a case of **osteitis deformans** in a male aged 66 years. The condition had been developing 18 years. On examination he was found to have the following conditions: Skull enlarged and flattened on top, giving the head a wedge-shaped appearance. Spine markedly kyphotic. Pelvis broadened, producing a condition as if the iliums had been pulled apart and the body allowed to sink somewhat down between them. Thorax almost quadrilateral, so that the scapulas came to lie on its lateral surfaces. Clavicles bent to an S. Humeruses



Fig. 26.—Montgomery's case of osteomalacia (Jour. Am. Med. Assoc., Aug. 8, 1903).

curved forward. Radiuses and ulnas also bent, with their convexity toward the extensor surfaces, the radiuses being more bent than the ulnas. Femurs markedly curved forward, also the necks being bent downward, so that tips of the great trochanters rise about three-quarters of an inch above Nélaton's line, giving rise to a condition of cross-leg. Tibias and fibulas also markedly curved forward. Hands and feet apparently free from deformity. Joints in no way affected.

Codman² reports a case of **bone cyst of a digital phalanx**. The patient was a woman about 40 years of age, who in 1900 presented herself for treatment for a swelling of the middle phalanx of the middle finger. The swelling was painless, of bony hardness, and not in the least tender. The condition was first noticed many months before. There

¹ Austral. Med. Gaz., May 20, 1904.

² Boston M. and S. Jour., Feb. 25, 1904.

was no history of injury or of any bone disease in other portions of the body. She was in good health and there was no specific history. At this time, however, the condition was thought to be syphilitic dactylitis, and the patient was given potassium iodid, which she took faithfully, but which produced no improvement. The appearance of the röntgen-ray plate was characteristic of medullary sarcoma. The phalanx was removed under cocain anesthesia, and the ultimate result was most satisfactory. The tendons were undisturbed, and the result was a most useful finger, the patient being able to hold a 5-pound weight on the flexed finger-tip. When the phalanx was sawed open it was found to be a shell of bone containing a cavity filled with straw-colored serous fluid and lined by a soft, translucent, myxomatous membrane and crossed here and there by fine trabeculas. Its gross appearance indicated it to be a myxochondroma, but the decalcified sections were lost and no microscopic examination was made. It was thought that this tumor was at first an enchondroma and later underwent myxomatous degeneration. Bone cysts are rare in any portion of the body, and so far as can be found, this case in a digital phalanx is unique.

JOINT DISEASES AND DISLOCATIONS.

A. A. Berg¹ divides the **joint complications of acute pyogenic osteomyelitis** into 2 classes. The true joint inflammations are due to bacterial invasion. The sympathetic or pseudoarthritides are not true inflammatory lesions, but are merely passive exudations into joints and periarticular structures. The true bacterial arthritis adds to the patient's toxemia and requires prompt treatment. The sympathetic form does not augment the septic symptoms, and tends to subside spontaneously. In every case of acute osteomyelitis a blood-culture should be taken at the time the bone is trephined. When there is only periarticular effusion, no interference is practised at the time of the primary operation. When the joint is distended, an exploratory puncture is made before attacking the bone. Should the exudate be serous or even seropurulent, no interference with the joint is made at that time, simple immobilization with the application of ice being the only treatment. Should the arthritis not show evidences of subsidence after drainage of the bone and the septic symptoms continue, a second aspiration is made. If the character of the fluid has remained unchanged, a wide trocar and cannula is introduced on each side of the joint and the articular cavity is irrigated with a 5 % solution of carbolic acid, followed by salt-solution. Such a procedure is usually followed by recovery of the joint, but should there be a reaccumulation, the irrigation may be repeated. Should the complicating arthritis be of a suppurating type, free drainage is indicated. For the milder grades of suppurative arthritis single or multiple incisions and drainage yield good results. For the severer types, affecting the knee, Mayo's operation is performed. This consists of a transverse anterior incision through the patella into the joint, with partial dislocation

¹ Med. Rec., Sept. 12, 1903.

of the femur and tibia by extreme flexion and dry packing of the synovial cavity.

R. H. Russell¹ recommends excision in **tuberculous disease of the joints** in adults. The result of excision in childhood is disastrous to the length of the limb. In diseases of the elbow or of the upper extremity of the humerus excision effects a speedy cure with a movable joint, while conservative treatment consumes a long time and eventuates in a stiff joint. In the ankle-joint free removal of all diseased tissue with excision of the astragalus is the most promising method. After removal of the astragalus the ankle-joint has no tendency to become rigid, while if the disease is thoroughly removed, the utility of the limb is but little if at all impaired by the loss of that bone. In joints, except in the wrist, erosion as a method of treatment does not lessen the time of treatment. In conservative treatment the absence of pain is an unfailing criterion of the efficiency of the method for securing rest. When a joint is acutely painful, absolute confinement to bed must be enjoined until the joint has become painless, and only then is any form of ambulatory treatment permissible. When a case comes under treatment early and suppuration does not occur, the use of the crutches and splint should be persisted in for 2 years. When suppuration has occurred, the sinus offers an index as to the progress of the disease. While it persists recovery is in the future; when it closes, the disease is cured, but even then a further 3 months of treatment is regarded as a necessary precaution. When the sinus has persisted for 2 years, exploration should be undertaken to ascertain whether a sequestrum is present.

R. H. Marten,² in an article on **tuberculous affections of joints** in adults, says the synovial membrane is the first structure to be attacked, whereas in children the disease is generally primary in the end of the bone. Extension is necessary only when bone-surfaces are affected; in synovial disease it may do more harm than good by stretching the already softened ligaments. Expectant treatment is continued as long as possible. In cases, however, in which there is an osseous deposit, great synovial thickening, sinuses, ankylosis in a faulty position, pulmonary tuberculosis, or in regions, such as the shoulder and elbow, in which a better joint can be obtained by excision, operation is indicated. Amputation is the least dangerous operation and is indicated in weak subjects, in those cases complicated by early phthisis, or in cases in which there is a recurrence after excision or arthrectomy. Excision in young people is harmful in putting a stop to the growth of the bone and leading occasionally to ankylosis in faulty positions, and, where possible, this treatment should be limited to adults. Arthrectomy is the operation for children up to the age where the epiphyses have ceased to grow. Excision of the hip is indicated where there is acetabular disease, in order to allow full access to the diseased bone, or in cases where there are septic sinuses, and in most cases where there is ankylosis with deformity. Arthrectomies in the knee in adults do badly as a rule, while excision

¹ Internat. Med. Jour. of Australasia, Apr. 20, 1904.

² Internat. Med. Jour. of Australasia, Apr. 20, 1904.

is a perfect operation. In the shoulder-joint the treatment at first should be expectant, but as the best that can be looked for is a stiff joint, early excision is called for. The same advice may be applied to the elbow-joint.

H. B. Allen¹ discusses the pathology of **tuberculous synovial joints**. There is probably no such thing as true primary tubercle of bones or joints, unless through some accidental or intentional inoculation. The primary point of bacillary invasion is in some mucous membrane. A primary synovial tuberculosis is of much greater frequency than is generally conceded. In these cases there are few bacilli present and very little reaction in the bloodvessels. The leukocytes that appear gather largely from lymph-paths and not directly from the blood. As a rule, no miliary tubercles are visible to the naked eye and crude caseation is extremely rare. Early hydrops or empyema is very uncommon. Cold abscesses may have very limited connection with the joint itself and may persist and extend even when the joint is undergoing repair. When tuberculosis of joints is repairing with ankylosis, recovery may be prevented by persistence of the disease in some neighboring or communicating bursa. Condensation of bone seldom occurs even with very chronic lesions. Cases with sclerosis, subperiosteal bone deposit, or stalactites are either purely syphilitic or specimens of tuberculosis in syphilitic cases. In the knee and elbow primary involvement of bone is not uncommon. In the ankle and wrist primary infection of the synovial membrane is the rule. In the hip the origin is more doubtful. General tuberculosis rarely follows joint-disease.

The *Lancet*² gives an abstract of Howard Marsh's Hunterian lecture on **periodic hydrarthrosis**, in which he describes 2 cases. In one the patient's knee became painful and swollen every night, and every morning it returned almost to normal. In the second case the knee became swollen every 2 weeks and the swelling lasted 3 days. From a study of 45 cases which have been recorded it is shown that the joint most frequently affected is the knee. Both knees may be affected, and the disease may be confined to this articulation, but any of the large joints may be involved. In some cases the affection is limited to the joint first attacked; in others it passes from one joint to another. The duration of an attack averages 4 days. The interval between the attacks is usually 2 weeks. In one case the disease disappeared during pregnancy. In most severe cases there is an effusion into the synovial cavity, while in others the chief change is a thickening of the synovial membrane. More women are attacked than men, and the disease is rare before puberty. In all but 2 of the cases bacteriologic examination discovered no organisms. Quinin and arsenic internally have been followed by good results in a few cases. The rapid appearance of the swelling and the equally rapid subsidence suggest that the lesion is vasomotor in origin, and therefore dependent on a disturbance of the nervous system, and this view is supported by the frequent occurrence of neuralgia in many of the cases. In one instance exophthalmic goiter was also present.

¹ *Intercol. Med. Jour. of Australasia*, Apr. 20, 1904.

² June 11, 1904.

Rudolph Matas¹ discusses the treatment of **bilateral cicatricial ankylosis of the jaws**. Cicatricial trismus in early childhood interferes with the development of the lower jaw and it remains rudimentary in size and shape. The eruption of the permanent teeth is likewise interfered with, the molars making their appearance in vicious attitudes. The secretions of the mouth are malodorous from stagnation, and there is a drooling of saliva when the angles of the mouth are involved in the contraction. The entire muscular apparatus undergoes atrophic changes from arrested development and disuse. In some cases the scar tissue in the rear mouth undergoes osseous infiltration. The various procedures which have been recommended for the permanent relief of cicatricial occlusion of the jaws are: 1. Division and excision of the scar tissue with substitution of transplanted skin or of mucous flaps for the lost mucosa. 2. Division and detachment of tendinous insertions and aponeurotic expansions of the muscles of mastication at their surface of attachment to the lower jaw (masseter, pterygoid, etc.), after division of the cicatricial bands in the mouth. 3. Creation of a new point or center of motion in the body of the jaw (pseudarthrosis) by osteotomy in front of the resisting and unyielding scar masses when these exist in the post-buccal space. 4. Excision of the temporomaxillary joint, condyle, or part of the lower jaw, with or without associated myoplasty. The operative treatment must be guided by a full knowledge of the seat of the conflicting bands, their extent, their density, and their association with secondary developmental defects or associated lesions in the osseous, articular, and muscular apparatus of the lower jaw. The intractable and difficult cases are those in which the lesions are symmetric and bilateral, which begin in inflammatory and necrogenic processes in the mucous membrane of the retrovestibular and pterygoid regions of the mouth in early childhood. The best results are obtained by early and persistent treatment. In neglected cases no single operative method is sufficient to obtain permanent relief. The cases involving the anterior portion of the mouth and cheek are most favorable for treatment, and the simple method of division of the cicatrices suggested by Mears will probably suffice. In the deeper cases a combination of methods, including autoplasmic skin transplantations, osseous section with the creation of a unilateral pseudarthrosis (Esmarch), with or without myoplasty, will be required to obtain a moderate degree of motion. Simple plastic operations to replace the lost mucous membrane by transplanting skin are necessary but not sufficient in posterior cicatricial contraction. They are adjuncts to pseudarthrosis. In making a false joint by Esmarch's or Rizzoli's method it is important that the procedure should be limited to one side only, because a bilateral pseudarthrosis will result in loss of control of the intervening fragment. The best results are obtained by unilateral pseudarthrosis, combined with bilateral plastic dermal transplantations, to which may be added, in the gravest cases, excision of the maxillary condyle on the side opposite the pseudarthrosis, without damaging the temporal, pterygoid, or masseteric attachments. By the

¹ Jour. Am. Med. Assoc., Nov. 28, 1903.

combinations of the methods above presented and a prolonged course of maxillary gymnastics following osteoplasty, functional results may be obtained even in the most forbidding cases, without, however, the expectation of attaining the surgical idea, as to either cosmetic or functional result. A case is reported in which, after 6 operations, a fairly satisfactory result was obtained.

W. J. Roe¹ reports 2 cases of **bilateral bony ankylosis of the temporomaxillary articulation** treated by resection of the condyles of the lower jaw. He is of the opinion that bony ankylosis in this joint invariably results from fracture. Fracture of the neck of the condyle was found 6 times in 41 cases of fracture of the lower jaw. In these cases the fragments are displaced toward the zygoma, to which they become united by callus-formation. Even with bony ankylosis it may be possible to move the jaw to a slight extent, owing to springing of the bone. The operation performed consists of a vertical incision 1½ inches in length over the condyle of the lower jaw. The fibers of the masseter are split by blunt dissection and the condyle removed subperiosteally. Injury to Steno's duct and the facial nerve is avoided by the blunt dissection. The greatest danger during the operation is from asphyxia. In one of Roe's patients it was necessary to perform quick laryngotomy. This accident is due to the falling backward of the hyoid bone when the jaw is opened, thus causing the base of the tongue and the posterior surface of the larynx to come in contact. To relieve asphyxia the jaw should not be pried open, but should be restored to the position it occupied when ankylosed. In addition, if necessary, a tenaculum may be put under the hyoid bone to pull it forward. Recent fracture of the condyle should be treated with an interdental splint or the Angle method.

F. T. Stewart² reports a case of **unilateral bony ankylosis of the temporomaxillary articulation** following necrosis of the lower jaw in a child of 6 years, in which a successful result was obtained by excision of the condyle of the lower jaw.

G. L. Walton³ gives the results of **cervical dislocation** in 7 cases coming under his observation. Two reduced themselves during sleep, 3 during etherization, and 2 were reduced by the method suggested by Walton. In cervical dislocation the head is tilted and rotated. If an articular process on the left slips forward, the head will be rotated to the right; if the process slips downward into the notch, the head will be tilted to the left; if the articular process has become caught on the crest of the process below, the head will be tilted to the right as well as rotated to the right. In bilateral dislocation the head will be carried forward and tilted backward. In the majority of cases of unilateral dislocation no paralysis occurs, sufficient of the lumen being left for the safe passage of the spinal cord. In the unilateral cases coming under Stewart's observation paralysis occurred in 2 only, and this was due to root-pressure. In one case of bilateral dislocation spastic paralysis of

¹ Ann. of Surg., May, 1903.

² Ann. of Surg., Mar., 1904.

³ Boston M. and S. Jour., Oct. 22, 1903.

the lower extremities indicated pressure upon the spinal cord itself. The method of reduction will be made clear by the following diagram (Fig. 27): "This diagram shows the upper surface of the lower of the two vertebrae concerned, that is, the one in normal position. The articular processes of this vertebra are marked *x, x*. The left articular process of the vertebra above having slipped into the intervertebral notch (*y*), the situation of the spinous process of the dislocated vertebra will be indicated by the dotted lines. The direction in which the head must be tilted for reduction is indicated by the line *z* (in other words, if the patient is facing north, the head must be tilted southeast). Slight rotation in the direction of the short curved arrow on the right of the diagram may be necessary to free the process. After the articular process is freed, rotation into place in the direction of the long curved arrow on the left of the diagram will complete reduction. In case the right articular process is displaced by the dislocation, these movements must be reversed. The patient should be in the sitting position for the operation, and the head should be rocked without traction, for traction only lessens the effectiveness of the fulcrum necessary to reduction."

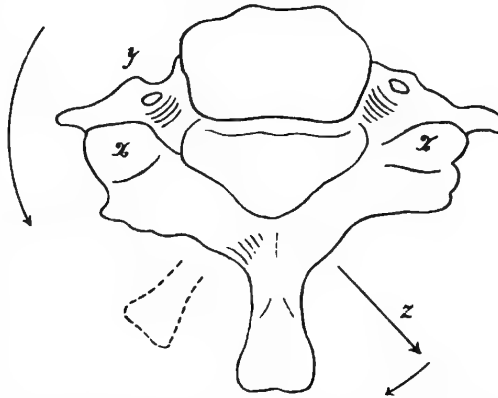


Fig. 27.—Diagram of upper surface of lower vertebra, arrows indicating movements for reduction (Walton, in *Boston M. and S. Jour.*, Oct. 22, 1903).

Dislocation of the outer end of the clavicle, with a report of 4 cases, is the title of a paper presented by J. G. Sheldon,¹ who divides these injuries into 2 classes—those in which the coracoclavicular ligaments are completely torn, and those in which complete rupture of these ligaments has not occurred. The latter group can be treated successfully without operation, but those in which there is complete rupture require operative procedures in order to secure satisfactory results. Complete rupture of the ligaments is indicated by the following signs: "1. Inability to reduce the dislocation. 2. Separation of the articular surfaces more than one inch. 3. Ability to produce a longitudinal separation of the articular surfaces $\frac{1}{2}$ of an inch, or to easily elevate the outer end of the clavicle. 4. Marked tendency to recurrence of the dislocation." The most approved method of operation consists in exposure of the joint by incision; drilling the clavicle and acromion; passing and tying two absorbable sutures; approximating ligaments and fascia with fine catgut; suturing the skin wound with silkworm-gut. Drainage is not necessary. In operating

¹ *Ann. of Surg.*, Sept., 1903.

old cases it may be necessary to free the clavicle from cicatricial tissue before complete reduction of the dislocation can be accomplished. Sheldon quotes freely from the literature of this subject, and reports the results of some experiments in the production of dislocations of the outer end of the clavicle upon the cadaver.

M. Cavaillon¹ reports the **reduction of a 6 months' old subcoracoid dislocation of the shoulder**. The scapula was fixed by means of a sheet held by assistants. The head of the bone was mobilized by rotation, abduction, and circumduction. Reduction was then effected by extension at right angles to the body and levering the head of the bone into place over a compress under the upper third of the bone. Temporary paralysis of the median nerve followed.

Carl Beck² reports a case of **humeroacromial suture for habitual dislocation of the shoulder**. An incision was made between the deltoid and pectoralis major muscles, the capsule was contracted by a purse-string suture, and a silver wire carried through the acromion and the head of the humerus. The wire was removed 5 weeks later. The result after 6 months seems to be perfect. [In a case in the Jefferson Hospital Dr. Dawbarn, of New York (who had kindly consented to hold a clinic), put a purse-string suture in the capsule. The man was cured, and has for several years pursued, without trouble, the arduous occupation of a hoseman in a busy fire company. He drags hose and does ladder work without trouble.]

George Tully Vaughan³ reports a case of **subcoracoid dislocation of the shoulder in which reduction was prevented by the detached greater tuberosity of the humerus**. After failure of the usual methods for reduction arthrotomy was performed and the tuberosity was dissected out; reduction was then easily effected.

Maunsell Moullin and Arthur Keith⁴ report a case of **backward dislocation of the head of the humerus caused by muscular action**. The patient was trying to strike a tennis-ball breast high with a back-handed stroke.

C. R. B. Keetley⁵ reports 5 cases of **old unreduced dislocation of the shoulder-joint** which were treated by operation: in one a gold plate was buried for 40 days. Of 100 cases of old unreduced dislocation of the shoulder collected by Finckh, reduction was attempted in 73; in nearly two-thirds of these it was successful. Up to the ninth week 46 out of 55 were reduced, and after the ninth week there were only 2 successes out of 16. Finckh says that if no complication exists, the prognosis of dislocations 2 to 4 weeks old is favorable; up to the ninth week, very good. Cases of longer duration are only exceptionally reduced without an operation. The most common fracture complication is separation of the greater tuberosity of the humerus; the next most common is fracture of the surgical or anatomic neck. Cases in which reduction is not effected sometimes improve wonderfully in the matter

¹ Lyon méd., Aug. 23, 1903.

² Med. News, Dec. 5, 1903.

³ Lancet, Jan. 23, 1904.

⁴ N. Y. Med. Jour., July 11, 1903.

⁵ Lancet, Feb. 20, 1904.

of usefulness. The long head of the biceps is occasionally but exceptionally torn from its attachments. The treatment lies between efforts to make a new joint by exercises, and attempts to effect reduction by means of manipulation or extension, open incision, and excision. Reduction may be tried at any time up to the end of the fourth month, except in old people with atheromatous arteries. Kocher's method should be tried first, then forcible extension, and if this fails, Kocher's method may be tried again. Fracture of the surgical neck of the humerus occurred in 4 of Finckh's 73 cases. Limited paralyses are sometimes caused, but they are usually only temporary. The structure especially endangered is the axillary artery. In Stimson's 44 cases of injury to the vessels the vein alone was ruptured in 3, the artery and vein in 2, and in most of the others the axillary artery was torn or one of its branches was injured. If the patient is old or if he has some visceral disease, no operation should be done, or if operation seems necessary because of pressure on the axillary nerves or vessels, the head of the bone should be resected. In other cases the decision between resection and attempted reduction may be deferred until the joint is exposed. The best incision is through the anterior margin of the deltoid, just external to the cephalic vein, with a horizontal cut 2 or 3 inches long through the deltoid, beginning at least $\frac{1}{2}$ inch below the clavicle. The coracoid process should be divided and turned down with the attached muscles. The greater tuberosity should be separated with a chisel. This and the coracoid are sutured on again after reduction. The head of the humerus is freed from adhesions and reduction attempted by the Kocher method. If this fails, a hook is placed around the neck of the humerus and another around the neck of the scapula; assistants pull strongly on these while the surgeon repeats the steps of the Kocher methods. If these methods are unsuccessful, excision should be performed.

George Tully Vaughan¹ reports a case of **luxatio erecta** in a man aged 66 years who was struck by a street-car. The arm pointed upward at an angle of 45°. Reduction was effected by extension.

Charles A. Powers² reports a case of **congenital dislocation of the left radius** and gives a summary of the literature on the subject.

Joel Goldthwait³ says **recurrent dislocation of the patella** is peculiar to young women, developing either with or without violence, and usually associated with flat foot and sometimes knock-knee. The tubercle of the tibia is displaced to the outside, so that the line of pull of the quadriceps is at an angle. In extreme cases the dislocation may become permanent. If seen in the beginning, correction of the flat foot, together with treatment to improve the general tone, will correct the trouble without operation. Operation consists in straightening the line of pull of the anterior thigh muscles by transplanting the outer half of the patella tendon, so that it is attached well to the inside of the tuber-

¹ Am. Jour. Med. Sci., Apr. 14, 1904.

² Jour. Am. Med. Assoc., July 18, 1903.

³ Boston M. and S. Jour., Feb. 18, 1904.

cle of the tibia. If the tendon is too long, it may be shortened at the same time. The relaxed capsule is a result of the mechanic pull, and disappears as the strain is removed. Of 11 cases treated, 7 were operated upon. Of the operated cases, 4 had the outer half of the patella tendon, and one had the entire tendon, transplanted to the inside, and as 3 had both knees treated, there are 8 operations with resulting strong joints in 7, the result in the eighth being uncertain. Of 3 cases in which other operations were performed, all relapsed.

Arpad G. Gerster¹ divides **acute suppurations of the knee-joint** into 3 groups—metastatic, traumatic, and those due to an extension from an adjoining osteomyelitis. Metastatic suppuration is mild in onset and chronic in course; the mildest forms show a tendency to spontaneous cure, and ought not to be meddled with. They occur frequently during and after puerperal fever, and in the newborn at the time of the separation of the umbilical cord. If the local symptoms are troublesome, the joint should be evacuated by puncture and irrigation practised. Rapid reaccumulation will demand incision and drainage. Suppuration due to osteomyelitis is treated by arthrotomy or by the Mayo method. Traumatic suppuration is usually virulent and must be dealt with radically.

Maunsell Moullin² reports a case of **transplantation of the biceps tendon for contraction of the knee** due to rheumatoid arthritis, the principle being to weaken the flexors and strengthen the extensors. The patient was a woman aged 30, who had suffered many years with rheumatoid arthritis. An incision was made on the outer side of each limb; the tendon detached from the fibula and passed through a slit in the quadriceps to the anterior surface, where it was fixed by sutures.

K. W. Monsarrat³ has operated upon 14 cases of **tuberculosis of the knee**. When the disease is in the bone without involving the joint, it should be removed without temporizing, because of the danger of involvement of the joint. Anatomically the most important point in operating on such a case is the limit of the synovial membrane. In extension the lateral reflection leaves uncovered the greater part of the lateral and posterior aspect of the femoral condyle, both externally and internally, and in flexion these aspects are almost entirely covered. Most of his cases were operated upon by erosion. After this operation flexion is likely to occur if the integrity of the extensor is interfered with. This may be prevented by splitting the quadriceps, the patella, and the ligamentum patellæ longitudinally, and so gaining access to the joint. When the joint is flexed, each half of the bisected extensor and the patella lies outside the line of the femoral condyle, giving a good view of the whole interior of the joint. At the completion of the operation the patella may be wired and the soft structures sutured.

C. G. Levison⁴ reports a case of **lipoma arborescens tuberculosum of the knee-joint** in a male aged 50 who had suffered with a swollen joint for several years. The condition is characterized by the develop-

¹ Med. News, Sept. 19, 1903.

² Brit. Med. Jour., Dec. 19, 1903.

³ Lancet, Nov. 7, 1903.

⁴ Jour. Am. Med. Assoc., Jan. 23, 1904.

ment of innumerable villi, which undergo a fatty transformation, the process being a lipomatosis of hypertrophic synovial villi. In consequence of impaired nutrition and diminished circulation infection with the bacillus of tuberculosis may occur. In the case reported the joint was opened and the growth excised.

Vautrin¹ reports a case of **outward luxation of the knee complicated with laceration of the external popliteal nerve**. This luxation is divided into 2 varieties—one in which the patella is not displaced, and the other in which it is carried over the external surface of the external condyle.

Percy W. G. Sargent² reports a case of **upward dislocation of the foot** occurring in a man aged 46 who fell a distance of 9 feet, alighting on the soles of his feet. The astragalus retained its normal relations with the foot, and was driven upward between the tibia and fibula without fracturing either bone. The points of interest are the increase of the intermalleolar measurement, the prominence of the heel, the approximation of the malleoli to the plane of the sole, the absence of fracture, the absence of laceration of the skin, and the extreme ease with which reduction was effected. Sargent finds but one similar case recorded.

VENEREAL DISEASES.

Becker³ reviews the literature of **heroin as an anaphrodisiac**. It is preferred to lupulin, camphor, and the bromids for the pain of chordee, epididymitis, prostatitis, cystitis, and testicular neuralgia. It is also indicated in nocturnal pollutions, in sexual neurasthenia, and after operations on the penis to prevent the morning erection.

Galewsky⁴ has carefully studied 14 cases of **nonspecific chronic urethritis**. This condition ensues after a long incubation—from 8 to 16 days. The symptoms are slight, and gonococci cannot be found in the discharge, although many other microorganisms have been discovered. In many cases filaments may be found in the urine for a year after the original infection. Concerning the question of marriage, a negative attitude should be assumed, as the infectiousness of the condition is not definitely known.

Asakura⁵ publishes the results of a bacteriologic examination of the normal urethra. In 14 (12.5%) of 112 male urethras he found streptococci, usually the *Streptococcus pyogenes*. After intravenous injection these organisms would kill rabbits in from 5 to 10 days.

Janet⁶ says **bacteriuria** may be due to external or internal causes. The most frequent external cause is infection of the bladder with the colon bacillus. This variety of cystitis responds to irrigations unless there is involvement of the ureter or kidney. Bacteriuria of internal origin

¹ Rev. de Chir., 1904, No. 4.

² Lancet, Oct. 17, 1903.

³ Berl. klin. Woch., Nov. 23, 1903.

⁴ Zent. f. d. Krankh. d. Harn- u. Sexual-Organen, 1903, Bd. xiv, Heft 9.

⁵ Zent. f. d. Krankh. d. Harn- u. Sexual-Organen, 1903, Bd. xiv, Heft 3.

⁶ Ann. des Mal. des Organes Genito-urin., 1903, No. 3.

is usually due to cocci, occasionally to the colon bacillus; the infection comes by contiguity from a neighboring organ or from a distance by the blood. The cause is often difficult to ascertain, and the treatment is unsatisfactory. A prostatitis or vesiculitis may repeatedly infect the bladder. It should be determined whether prostatitis is the cause or effect of bacteriuria, as microorganisms eliminated through the urine may cause inflammation of the urethral mucous membrane. If, after washing out the bladder, a few bacteria can be found in the urine, the infection is in the lower urinary tract; if many bacteria are found, the infection is renal or ureteral. Bacteriuria the result of infection of the bladder or prostate is treated by irrigations and massage, with urotropin internally. Bacteriuria of internal origin is less rare than is generally supposed; bacteria appear in the urine in certain intestinal diseases, as typhoid fever and membranous enteritis. A colon bacillus cystitis may accompany constipation. In these cases urinary remedies are useless. In any case urotropin is the best internal remedy, but before giving large doses of this drug the question of individual idiosyncrasy should be determined.

MacLaurin¹ states that recent bacteriologic work appears to throw doubt on the **value of the microscope as a diagnostic agent in gonorrhea**. The appearance of the real gonococcus is fairly definite, and it is undoubtedly pathognomonic; but it may be confused with other cocci and apparently is not always found. It is found only by coverslip preparations in 23 % of cases having a clinical history of gonorrhea. It is a small diplococcus, in shape like 2 kidneys placed together; it decolorizes with Gram's method, and occurs in clumps. To be characteristic, these clumps ought to occur in and around the pus-cells, but they may occur independently. Other cocci resembling these are also found; they occur in smaller clumps in the cells, but generally retain Gram's stain. A positive discovery of the gonococcus is valuable evidence; its absence is not of great weight one way nor the other. For the **treatment of gonorrhea in the female** the following is recommended: A speculum is passed and all discharge dried away both from the os uteri and from the external parts. The whole canal is then swabbed with silver nitrate, 20 grains to the ounce. This is left to act for a few minutes, and then washed with water containing a little common salt. A plug of cotton-wool soaked in ichthyol 1 part and glycerin 9 parts is then inserted and left for 12 hours. This treatment is repeated twice weekly, the patient inserting a plug every night. She should be warned that with every case the nitrate will stain the underlinen and that the course of the disease is often very tedious. The value of the douche is questionable; it often causes much pain, and the nozzle may carry the infection higher.

J. S. Purdy² speaks of the value of argyrol in the treatment of gonorrhea. Its effect on the mucous membrane is bland and nonirritating; he has seen no complications during its use. Its only objection is its cost. Like other silver preparations, it causes stains on linen and undercloth-

¹ Austral. Med. Gaz., Nov. 20, 1903.

² Lancet, Dec. 19, 1903.

ing; these are, however, easily removed by a solution of potassium iodid and warm water. He has also found argyrol of value, in 50 % solution, in tertiary syphilitic ulcers and syphilitic lesions of the mucous membrane of the tongue, mouth, and nose.

Ferdinand Fuchs¹ recommends **albargin for the abortive treatment of gonorrhea**. Albargin contains 25 $\frac{1}{10}$ % silver nitrate, and is soluble in water. The treatment should be used within 2 or at the latest 3 days after infection. Fuchs distends the anterior urethra with a 2 % solution, which is retained for 5 minutes; this is followed by a second injection, which is retained for 3 minutes. The third injection is now given and is retained for 2 minutes. In 6 cases in which this treatment has been used the results have been very satisfactory.

Moriz Porosz² recommends as an efficient **prophylactic against gonorrhea** a 1 % to 2 % solution of pure concentrated nitric acid as an injection after coitus.

Paul Rychner³ speaks warmly of the value of **ichthargan in the treatment of gonorrhea** in all its manifestations. He reports 22 cases which recovered quickly, without pain, from the treatment and without complications. He recommends urethrovessical irrigations with a $\frac{1}{4}$ % to $\frac{1}{2}$ % solution, or injection with a similar solution, and finally instillation with a 2 % solution.

E. Fraenkel⁴ writes on the **treatment of vaginal gonorrhea by the application of yeast**. This "zymin" is composed of dead yeast-cells, but is as efficient as the living yeast. In 5 cases of chronic vaginal and cervical leukorrhea and in 2 cases of gonorrhea the treatment was followed by prompt recovery.

F. Carcy⁵ says there is no specific **treatment for gonorrheal epididymitis**. Direct injury may be done by frequent inunctions of such drugs as mercury. Absolute rest of the organ, together with sodium salicylate, is the best treatment. Severe pain or a slight tendency toward absorption calls for puncture.

J. Janet⁶ gives the following regulations for the **prophylaxis of gonorrhea**: On the feminine side, a sponge is introduced into the vagina before coitus, and, immediately afterward, the sponge is removed, the vagina irrigated, and the bladder emptied; on the male side, the bladder is emptied and the penis washed with soap and water. Other methods of prophylaxis are the condom, the introduction of vaselin into the meatus before coitus, washing after coitus, paying particular attention to the prepuce and the frenum, with a 1 % solution of sublimate, or, lastly, the dropping of a silver solution into the meatus.

O. Abraham⁷ recommends for the **treatment of gonorrhea in women** a suppository consisting of yeast, asparagin, and gelatin, the whole being covered by paraffin. Of 34 cases in which this treatment was

¹ Therap. Monatsh., 1903, No. 10.

² Dermat. Zent., May, 1903.

³ Ann. des Mal. des Organes Genito-urin., 1903, No. 17.

⁴ Deut. med. Woch., 1904, No. 1.

⁵ Thèse de Paris, 1903; Zent. f. Harn- u. Sexual-Organ, vol. xv, No. 5.

⁶ Ann. de la Polyclinique cent. de Bruxelles, 1903, p. 274.

⁷ Deut. med. Presse, 1903, No. 20.

used, 30 recovered in from 5 to 23 days. In the 28 cases in which gonococci were found before the treatment, the organisms could not be demonstrated at the end of treatment.

H. Klimeck¹ reports 2 cases of **membranous urethritis** occurring in the course of gonorrhea. In both cases strong injection fluids had been used before the appearance of the membrane. The membrane consisted of fibrin and epithelial cells, streptococci, bacilli, but no gonococci.

Peyri² warmly recommends **picric acid in the treatment of gonorrhea**. He uses a 1 % to 2 % solution as an injection. The discharge, together with the gonococci, should disappear within 2 weeks. The patient experiences no discomfort. The treatment is as efficacious in chronic gonorrhea as in the acute form.

E. Rottenbiller,³ as the result of the study of 111 cases of **gonorrheal rheumatism**, reaches the following conclusions: This complication of gonorrhea is frequent. In about 33 % of the cases more than one joint was involved. There seems to be a parallelism between the clinical course of the disease and the number of the bacteria found. Mixed infection is very frequent. A long course and great tendency to destruction are characteristic. Anemic and lymphatic individuals seemed particularly prone to the condition. The rheumatic infectious arthritis gives a certain immunity against gonorrheal arthritis. In the therapy, before all things one should attend to the urethral discharge.

Blokusewski,⁴ in an investigation concerning the **prophylactic treatment of gonorrhea**, found albargin very lethal to the gonococci. In a 3 % solution gonococci were killed in 10 seconds; in a 4 % solution, in 5 seconds; and in a 5 % solution they were killed immediately. He uses a hand-apparatus and an 8 % solution of albargin. For prophylaxis against syphilis he advises a rubbing into the penis, before coitus, of an ointment containing 1.6 % formalin.

Serre and Delipny⁵ advise the following for the **abortive treatment of gonorrhea**: By means of a blunt instillation syringe (18 to 20 F. caliber) a 5 % solution of silver nitrate is put into the urethra. The syringe is passed into the urethra for 8 cm., a few drops of the solution expressed, and the syringe slowly withdrawn as the solution is injected drop by drop. The patient urinates before treatment and must not urinate for 2 hours after the treatment. This instillation cannot be used again for a few days on account of the reaction. By means of this treatment recovery will ensue in 75 % of those seen on the first day and in 50 % of those seen on the second day.

M. Reifsnor⁶ says the value of **internal treatment in gonorrhea** is doubtful. The most favorable combination is that of santal oil (80 %) with kawaharze (20 %), or **gonosan**, as it is called. Kawaharze acts as

¹ Wien. med. Presse, 1903, No. 49.

² Gazeta Med. Catalana, Rev. espanola de sif. y dermat. Vias urinarias, 1904, No. 61; Zent. f. Harn- u. Sexual-Organen, 1904, vol. xv, No. 6.

³ Budapest kgl. Aerzteverein, Dec. 5, 1903.

⁴ Derm. Zent., vol. vii, No. 2.

⁵ La Presse med., 1903, S. 450.

⁶ Deut. med. Zeit., 1903, No. 5.

an astringent and anesthetic. Reifsner has used it in 35 cases with the best results.

C. A. Powers¹ reports a case of **diffuse gonococcus infection of the entire upper extremity**. The patient was a man, aged 28, who, on the ninth day of a urethritis, complained of pain about the elbow. The infection spread and finally involved the whole upper extremity. A number of incisions were made into the arm, all of which liberated a thin, clear fluid, except one near the elbow, which gave exit to a thin pus. Cover-slips and cultures showed gonococci and staphylococci. Later the infection spread to the chest, neck, and parotid gland. Recovery finally took place. Practically all the tissues of the body may be affected by the gonococcus. Most often the process invades the joints, but the gonococcus has been recovered from the peritoneum, the pleura, the pericardium, myocardium and endocardium, the meninges of the brain and spinal cord, the periosteum, the perichondrium, muscles and tendon-sheaths, bursas, fascia, the skin, distant lymphatic glands, the parotid glands, the kidney, and the blood-current.

T. J. Strong² reports a case of **systemic infection by the gonococcus**. Following a gonorrhea, pain and swelling occurred in the right neck, arm, and leg and in the left arm. Later several abscesses were opened, and from these was obtained a pure culture of gonococci. Recovery finally took place.

C. Engelbreth³ recommends for the **abortive treatment of gonorrhea** irrigation (Janet) of the anterior urethra with a $\frac{1}{4}$ % to $\frac{1}{2}$ % solution of silver nitrate. The abortive treatment can be applied only during the first 2 or 3 days, while the inflammation is superficial. In 9 cases in which this treatment was used the discharge ceased in 2 days.

Oscar Hoffman⁴ says that **metastases of gonorrhea** to distal points of the body, such as the joints, pleura, and endocardium, cannot be accounted for by extension through continuity. He lays great stress on the importance of erection in forcing the gonococci into the blood- and lymph-streams. Hence the importance of therapeutic methods for the prevention of erections during the course of an attack of gonorrhea.

Lewin⁵ points out the great difference, both clinically and pathologically, between the **gonorrhea** which attacks squamous epithelium and that which attacks cylindric epithelium. When the gonococcus invades squamous epithelium, such as that which covers the female urethra, the vagina, and the fossa navicularis, the disease is mild, the inflammation superficial, and recovery in many cases is spontaneous. The chief danger of this variety is that it may spread to parts covered by the cylindric epithelium in which the gonococcus buries itself and penetrates into the subepithelial tissues. Irrigations and injections will cure superficial gonorrhea only. The best method is that of Janet; the best solution,

¹ Med. Rec., Oct. 3, 1903.

² Jour. Am. Med. Assoc., May 14, 1904.

³ Monatsh. f. prakt. Dermat., 1903, Bd. xxxvi, No. 10.

⁴ Zent. f. d. Krankh. der Harn- u. Sexual-Organ, 1903, Bd. xiv, Heft 5.

⁵ Med. Rev. of Rev., Mar. 25, 1903.

protargol, 4 %. When the case is not seen until the deeper tissues are involved, irrigations are of little value and the treatment should be expectant until the violent symptoms subside.

Frazer¹ believes the **prostate** to be affected in 90 % of the cases of **gonorrhea** of the posterior urethra. The prostatitis varies from a superficial involvement of the ducts of the glands to infection of the whole gland. When the organ feels irregular, only groups of glands are inflamed; when the whole organ is uniformly enlarged, the inflammation is universal. The gonococci invade the prostate from the posterior urethra, penetrate between the cells of the tubules, and invade the sub-epithelial tissues. The tubules are distended with altered prostatic secretion, pus-cells, and gonococci. With removal of the cause the inflammation subsides when the patient is young, the connective tissue contracts, and the gland becomes hard. In older individuals the connective-tissue increase is apt to continue, causing an increase in the size of the gland.

H. G. Klotz² treats **acute and subacute anterior gonorrhea** by retrograde injections of stronger solutions of silver. He is convinced that the mucous membrane of the urethra shows much less irritation, subjective and objective, when solutions are allowed to flow in a retrograde direction—that is, from the bulbus to the meatus—than when administered in the contrary direction—from the meatus to the bulbus. The syringe he uses is an enlarged Braun's intrauterine syringe, the opening in the tube being located in the side of a bulb at the end of the syringe, so that the fluid is not easily projected beyond this point of the syringe itself. Lubricated with the injection fluid (protargol, argonin, albargin) or some other lubricant, the point of the tube is carefully inserted within the orifice and quickly passed down to the bulbus, when the syringe is slowly emptied of its contents. The fluid is retained in the canal for 2 or more minutes. Eight or 10 hours after the injection the patient should begin injections of some of the common antiseptic or astringent solutions. After 4 or 5 days the silver injection should be repeated, and at this time the condition of the urethra warrants a stronger solution. Treatment is continued in this manner until the discharge disappears, when all injections are discontinued. Toward the end of the injections the test with beer is allowed. If, after a reasonable number of injections, a cure or decided improvement has not been effected, an endoscopic examination usually reveals some local condition which explains the persistence of the trouble. A cure should be conceded if the gonococci do not reappear after several weeks of return to the usual mode of living. It is not always possible to remove all the threads, and efforts to accomplish this object often do more harm than good. These filaments are innocuous, provided there are no gonococci found on repeated examination. He has used silver nitrate in solution of from $\frac{1}{10}$ % to $\frac{1}{2}$ %. When the inflammation is intense and the mucous membrane very sensitive, he occasionally resorted to thallin in 7 % solution. Of the various organic solutions, albargin seemed to be the most satisfac-

¹ Brooklyn Med. Jour., Apr., 1903.

² Med. News, July 11, 1903.

tory. Argonin has been employed up to 10 %, protargol, 2 % to 4 %, albargin, 1 % to 5 %, ichthargan, up to 2 %, argentamin, from 5 % to 10 %. All the newer remedies cause an increase in inflammation and secretion, furnishing a more favorable condition for the development of the gonococcus; therefore it is advisable to use a gonococidal injection only at stated intervals, to avoid cumulative irritation; in the interval an astringent antiseptic injection, such as the following, should be used:

| | | |
|-----------------------|-----------|-------------|
| R. Boric acid | 1.5 gm. | (24 grains) |
| Lead acetate | | |
| Zinc sulfate, of each | 75.0 cgm. | (12 grains) |
| Glycerin | 4.0 gm. | (1 dram) |
| Water | 120.0 gm. | (4 ounces) |

Cases coming under treatment within a few days after infection are cured within a few days.

E. C. Burnett¹ investigated the permeability of the urethra for certain silver salts. He conducted a series of experiments with argyrol on dogs. This salt is very soluble and readily washed from animal tissues. It was necessary to find some means of precipitating it into the tissues. A solution of hydrogen sulfite, slightly acidulated with hydrochloric acid, produced an insoluble black stain of the tissues containing argyrol. In the first series of these experiments the urethras of dogs were injected with solutions of argyrol in the strength of from 1 % to 5 %. This was repeated for 6 days, and on the last day, after washing the urethras thoroughly so that no postmortem staining could take place, the urethras were removed. The tissues were then immersed in a solution of hydrogen sulfite to fix the silver taken up by the cell, and were then prepared for the microscope. In the next series of cases rabbits were used instead of dogs. In all the experiments the results were the same. It was found that the silver solution did not penetrate, only the upper surface of the top layer of cells showing a trace of silver in the form of a thin black line of silver sulfite, the result of the reduction of the residue of the silver salts with the hydrogen sulfite left after washing.

A. Nelken² considers the prostate in the cure of gonorrhea. Most practitioners overlook the possibility of prostatic disease as complicating urethritis unless attention is called to the gland by sharply defined symptoms. Wassildo says that the prostate is involved in 94 % of gonorrheas. In 214 cases of gonorrhea Greene found involvement of the prostate in 66 %; Frazier found it in 90 % of the cases of posterior urethritis; in 210 cases of posterior urethritis Frank found the prostate infected 210 times. A consideration of the anatomy of the prostate and prostatic urethra shows that it is unreasonable to suppose that infection can invade the latter and not involve the former. The prostate is frequently infected without any symptoms pointing either to the gland or to the prostatic urethra. In the majority of the milder cases recovery without treatment takes place. Massage of the gland is an essential part of the treatment of chronic follicular prostatitis. It should be con-

¹ Med. Rec., Sept. 12, 1903.

² New Orleans Med. Jour., Jan., 1904.

tinued from 5 to 10 minutes twice a week in the average case. It should be preceded by urination and followed by an antiseptic urethrovessical irrigation.

Fritz Meyer¹ made a careful search for the **gonococci** in 90 cases of **chronic gonorrhea** by microscopic and cultural methods. In 58 of the cases the organism was found both by culture and by the microscope. In the remaining 32 the culture and microscope disagreed, 29 showing the gonococcus by culture and 3 showing the gonococcus by microscopic examination alone. In all the cases the gonococcus was found either by culture or by microscope or by both. There is no ideal method for the detection of gonococci. One can by neither chemic nor instrumental means obtain proper material from the urethral mucous membrane for thorough microscopic examination. At the present time the cultural method is much the surer.

Georg Berg² reports an interesting **complication of gonorrhea**. During a first attack of gonorrhea the patient developed an epididymitis on the left side and then an epididymitis on the right side. That on the left side subsided, while that on the right persisted. At the time of examination there were 2 fistulas in the bottom of the scrotum, apparently connected with the lower pole of the right testicle, and which continually leaked urine. The testicle and the spermatic cord were both swollen and surrounded by inflammatory tissue. The discharge from the urethra contained gonococci. Examination of the urethra revealed no stricture, but by the endoscope was found a bleeding mass of granulations before and behind the bulbus, representing the urethral and the scrotal fistulas, which Berg believes to be the result of periurethral abscess. The internal orifices of the fistulas were touched with a 2% silver solution and finally closed.

Baermann³ claims that **gonorrheal epididymitis** is due to extension of the inflammation along the vas deferens, and that the gonococci may be found in the fluid drawn off by puncture, and that in some cases the gonococci reside in the epididymis for years.

J. P. Tuttle⁴ calls attention to the **harm often done to the rectum by unwise efforts to treat vesiculitis through that organ**. The disease may be due to gonorrhea, tuberculosis, or to invasion by the colon bacillus or ordinary pus-organisms. In his experience it has been rare in those cases which have not been subjected to instrumentation or forcible irrigation of the posterior urethra. The pressure exerted on the deep urethra by the Valentine method in cases of spasm of the neck of the bladder might easily distend the ducts and carry the infection up toward the vesicles. Aside from painful erections and emissions, frequent and straining efforts at urination, and sometimes retention of urine, most of the symptoms were referred to the perineum and rectum. There usually occurred aching in the sacrum and pelvis, rectal tenesmus, pain on defecation, shooting down the legs into the testicle and to the end of the penis. Diagnosis can be made only by rectal examination, and

¹ Deut. med. Woch., 1903, No. 36.

² Deut. med. Woch., xxix, No. 40.

³ Wien. med. Woch., 1904, No. 2.

⁴ Med. Rec., Dec. 12, 1903.

this is best done with the patient in the knee-chest position and with the bladder moderately filled with urine. The finger detects unusual heat, tenderness, and swollen, irregular masses leading upward and outward from the lateral lobes of the prostate. The prostate is usually swollen and tender. In all such conditions requiring prolonged rectal irrigations 2 soft catheters of rubber were more satisfactory than the metal irrigators. In the very early stages cold water, gradually lowered in temperature from 90° to 50° by putting ice in the reservoir after the flow had begun, was best. The bag should not be so high as to cause a forcible injection of the fluids; prolonged rather than intense cold was to be desired. After the acute symptoms have subsided, one should change from cold to heat, being careful not to raise the temperature above 110° to 115°. To this he advised the adding of $\frac{1}{4}$ % to 2 % hydrastis. When the swelling and pain persisted, irrigation over the vesicles through the rectal speculum would often start resolution when nothing else would. Temperature was best reduced by the application of guaiacol along the course of a vas deferens. Pain is best relieved by aconite, acetanilid, or phenacetin; opium should be avoided on account of its constipating effect. Frequent rectal examinations should be avoided. Hydrastis and ergot internally had good effect in chronic conditions.

Eugene Fuller¹ gives a further report on his **method of exposing and draining the seminal vesicles**. In order to facilitate an accurate dissection through the soft, elastic, and yielding perineal structures, they should be made to assume a stable position by making them taut. To accomplish this the patient, with his thighs sharply flexed, was put belly downward on a Trendelenburg table, the buttocks protruding somewhat over the end, while the flexed thighs straddled the table. The end of the table was then inclined upward quite sharply. The body was maintained in this position by sand-bags, strappings, and the attention of the assistants. An antiseptic lubricated cotton tampon with a tape attached was pushed into the previously cleansed rectum, well up into the region of the sigmoid, in order to guard against bowel leakage. No catheter was necessary or advisable, but the bladder was emptied before the administration of the anesthetic. The external incision consisted of two, somewhat converging, longitudinal cuts, which were connected at their dependent and proximal extremities by a transverse cut. The longitudinal cut to the operator's right began a little above the patient's coccyx, and just inside his right ischium, and extended downward and slightly inward, keeping just within the border of that bone, passing the tuber ischii, and ending somewhat below that tuberosity, at a point laterally and about $\frac{3}{4}$ of an inch anteriorly to the anterior margin of the anus. The longitudinal cut to the operator's left corresponded exactly to the one just described. The transverse cut connected the converging ends, dividing the perineum transversely, about $\frac{3}{4}$ of an inch anterior to the anterior margin of the anus. These cuts were deepened, cutting through the lower fibers of the gluteus maximus and the anterior layer of the deep fascia, care being taken to avoid the sphincter muscle. The

¹ Med. Rec., Sept. 12, 1903.

forefinger of the left hand was placed in the rectum, to guard against injury of the gut during the dissection between the urethra and the bowel. The levator ani and the visceral layer of the pelvic fascia are severed, and the right forefinger inserted through the cut in the pelvic fascia into the lymph-space, which lies between the prostate and the rectal wall. The left forefinger is also passed into this opening, which was stretched, stripping the rectal connections from the seminal vesicle and the posterior bladder-wall, leaving those parts exposed to direct surgical attack. At the completion of the operation the walls of the wound were carefully adjusted by deep sutures, so as to bring the rectum back into its original position, a small space being left for gauze drainage. If the sutures around the rectal portion of the wound were not deep, some tendency to rectal prolapse might develop. Temporary retention of urine was apt to develop, especially when much gauze packing was left. Fuller has opened and drained thickened and distended seminal vesicles, freed them from dense, inflammatory adhesions, and removed a neoplasm from one of them, and had entirely extirpated one. In 14 cases there have been no deaths. In a considerable number of cases there was prompt relief from reflex symptoms, while in some, several months elapsed before such relief was experienced. In most of the cases there was thorough restoration of the sexual functions, though it might be 4 or 5 months before this result was obtained. He strongly advocates the operation in aggravated instances of seminal vesiculitis associated with marked subjective symptoms, which persisted in spite of treatment by stripping the organs by a finger introduced into the rectum. He did not recommend the operation in tuberculosis.

Von Bartrina¹ reports 14 cases of **stricture of the urethra treated by gradual dilation and massage**. He has found, by pathologic examination, that all strictures, even the oldest, have in their composition some fresh inflammatory tissue; this he believes should be dissipated and absorbed by massage. The sounds not only mechanically widen the canal, but also cause a diapedesis of leukocytes which make their way through the meshes of the fibrous tissue and assist in its absorption. Massage is practised from the outside, while the sound stretches the stricture from within.

Therman² reports 4 cases of **stricture of the urethra treated by resection**. In the first case the stricture was the result of an injury 7 years before, and was located in the anterior portion of the urethra. The stricture admitted a No. 13 F. sound, and behind it was a large diverticulum the size of a hen's egg. The second was situated in the bulbus urethræ, admitted a No. 21 F. sound, and was of traumatic origin. The third admitted a No. 8 F. sound, was situated in the perineal urethra, and was the result of an abscess. The fourth case resulted from a bullet wound which destroyed $\frac{1}{2}$ inch of the urethra. Resection and urethrorrhaphy were followed in each case by a satisfactory result.

Laredde,³ in speaking of the **dosage of mercury in the treatment of**

¹ Ann. des Mal. des Organes Genito-urin., 1903, No. 10.

² Zent. f. Chir., Nov. 14, 1903.

³ Jour. des Praticiens, Feb. 7, 1903.

syphilis, says the result depends more upon the quantity of drug absorbed than upon the special preparation used. When injections are used, the amount absorbed remains unknown. When the drug is used hypodermatically, the exact amount absorbed is known and large doses may be employed. The biniodid and benzoate may be used in doses of from $\frac{1}{4}$ to $\frac{1}{2}$ grain daily, and if improvement does not follow, the dose may be increased.

Neuman¹ draws attention to the great importance of diagnosing **extragenital chancres**. The syphilitic primary lesion is frequently unrecognized when not on the genitals, and is a source of great danger to others. In 4634 chancres the situation was extragenital in 20%, the most frequent situations being the lower lip, the upper lip, fingers, hands, and the tonsils. When the initial lesion is found on the tonsil or palate, the induration is not marked, as a rule, and when on the palm of the hand, it may be found as a sharply demarcated, infiltrated, brownish-red, desquamating patch. He also mentions the appearance of a thickening of the tissues or of gummas in the area originally occupied by a chancre. Most of the mistakes are made in mistaking a chancre for an epithelioma.

E. von Hippel,² in an article on the **frequency of joint affection in congenital syphilis**, found that in 77 cases the joints were involved in 68. Of these, he was able to examine 43 cases showing joint changes. The condition was equally common in the two sexes. Five of the cases had no keratitis, but 2 of these had other varieties of eye trouble, so that 3 only had no affection of the eyes. The knee was involved 41 times—35 times the knee alone, and 6 times with disease in other joints. In one case the elbow alone was affected, and in one case several joints were affected. In 36 cases there was effusion into the joint, and in 3 cases the bone was thickened. The condition was met most frequently between the sixth and the tenth year. In 35 cases in which keratitis was also found the joint disease preceded the eye trouble in 32, the interval being in 10 cases from 2 to 15 years. This fact renders the joint affection more difficult of diagnosis.

DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

C. P. Gildersleeve³ (Brooklyn) deals with **injury as an alleged cause of certain nervous diseases**. This article has rather a medico-legal bearing, but Gildersleeve discusses particularly the etiologic value of traumatism in the production of multiple sclerosis, paralysis agitans, locomotor ataxia, traumatic hysteria, and traumatic neurasthenia. He does not believe that multiple sclerosis could develop as a primary disease from an injury unless the injury were of sufficient violence to cause some morbid change in the nervous system as a direct result of that injury. Injuries which are so slight as to pass by practically unnoticed are certainly incompetent to produce multiple sclerosis.

¹ Wien klin. Woch., Sept. 25, 1902. ² Münch. med. Woch., Aug. 4, 1903.

³ Brooklyn Med. Jour., Mar. 1904.

Although some writers have expressed the opinion that locomotor ataxia may be caused by injury, Gildersleeve does not believe that this disease is ever primarily caused by trauma. The injury, however, may act as an exciting cause. It has been stated that the disease may be secondary to injury to the peripheral nerves by causing a neuritis which ascends to the posterior spinal ganglions. This, it is believed by some, may occur, although Gildersleeve doubts it. He believes that an injury of sufficient violence to cause organic changes in the spinal cord is not one which will select one column to the practical exclusion of others. He has seen but one case in which he believed that paralysis agitans was produced by injury. Reported cases of paralysis agitans caused by fright are sufficiently numerous to make Gildersleeve believe that the disease may arise from fright only. Hysteria and neurasthenia due to traumatism are frequently met. These patients deserve more sympathy and care than they often get, although they can correct many of the minor symptoms at will. No one item is more responsible for the recovery of these cases than the settlement of litigation.

M. L. Harris¹ (Chicago) advises the **use of silver-foil to prevent adhesions in brain surgery**. The use of other materials, such as gold-foil, rubber tissue, the membrane of an egg, etc., is discussed. Silver-foil has been used by Harris in a number of instances and found satisfactory. He reports a case which illustrates its use.

Harvey Cushing² discusses a **pneumatic tourniquet** which he finds **particularly useful in craniotomies**. After enumerating the disadvantages of the older method of elastic constriction for the control of hemorrhage, Cushing describes his apparatus, which consists of a circular elastic tube inflated to the desired degree by an ordinary bicycle-pump. In craniotomies the apparatus is of the greatest advantage and its use is minutely described. In these cases a sterile cloth is placed closely over the head and the constrictor then put in position and inflated. The gauze covering the field of operation is then cut away and the craniotomy proceeded with. This apparatus can, of course, be used upon the extremities.

Ransohoff and Phelps³ report a case of **fatal hemorrhage from trephining**. Reference is made to other cases in which profuse and fatal hemorrhage has occurred from simple trephining. The case reported was that of a woman, 30 years of age, who was operated upon for a brain-tumor. A horseshoe-shaped incision was made for the purpose of turning back an osteoplastic flap. A division of the bone was then started with an electric drill. From this opening there was quite profuse bleeding. The smallest Sudek's fraise was next inserted, for the purpose of making a resection of the skull in the line of the scalp-incision. About one inch of the bone had been cut through when the hemorrhage became so profuse that it was deemed unwise to proceed with the operation. Bone-wax was pressed into the line of the divided bone, but did not control the hemorrhage. Compres-

¹ Jour. Am. Med. Assoc., Mar. 19, 1904.

² Med. News, Mar. 26, 1904.

³ Ann. of Surg., Oct., 1903.

sion of both carotids was equally futile. As speedily as possible a large trephine opening was made, the scalp and periosteum having been rapidly elevated over the bone. With the rongeur forceps the bone was removed as rapidly as possible in order to get at the source of the bleeding, but in the mean time the patient became blanched and pulseless. She died about the time the dura was exposed. The autopsy revealed a gliosarcoma the size of a small peach directly under the trephine opening. This report is illustrated by a drawing and 2 radiographs showing the venous sinuses of the skull. The examination of the skull shows that the groove for the lodgment of the superior longitudinal sinus, anterior to a point midway between the lambdoid and coronal sutures, was much widened, being 4 cm. wide on the frontal bone, where it should be a mere trace. Posterior to the point above taken and almost opposite to the posterior pole of the trephine opening the groove for the longitudinal sinus abruptly narrows, being 1 cm., and appears normal. Anterior to the transverse plane of the above point, lateral to groove and in the groove for the sinus, are numerous openings, greatly enlarged foramina, through which the dural veins and the diploic veins anastomose. The most remarkable changes, however, are the bony canals for the diploic veins. This change is almost limited to the left side—the side of operation. Remembering that the occipital diploic veins are much the largest, and noting that in the specimen they are normal, their opening may be used as a standard of comparison. It would have been impossible to have predicted such a condition of the skull in contemplating the operation for the brain-tumor, unless there had been evidence that tissue and dural growth infiltrated the bone. That the increased general intracranial pressure from clearly subdural tumors, as in the above case and in that mentioned by Starr, is capable of inducing marked dilation of the diploic veins and the parasinoidal lacunas must be borne in mind. In another case Ransohoff found it necessary to ligate the carotid in order to control profuse bleeding, but in the present case nothing short of ligation of both carotids has availed, and the patient died before an exposure of the carotid could have been made.

A historic review of the **surgery of hydrocephalus** is presented by B. M. Ricketts¹ (Cincinnati), who reaches the following conclusions: 1. Excessive secretion of the cerebral meninges may occur in any form of animal life. 2. The various forms of vegetable life are subject to excessive local or general secretion to a fatal degree. 3. Hydrocephalus, ventricular or meningeal, may develop *in utero* or at any time throughout infant or adult life. 4. The cases of spontaneous recovery are probably numerous, especially in infant life, in which the arachnoid is alone involved. 5. All cavities may unite, with or without external rupture; when so, it is usually fatal—not necessarily instantly so. 6. Spontaneous rupture may occur externally or subcutaneously, with an occasional recovery. 7. The effusion may be into the lateral third or fifth ventricle, or it may be in the arachnoid or subarachnoid cavity, one or all. 8. A

¹ Amer. Med., June 18, 1904.

clot in the arachnoid cavity may cause a cyst which will enlarge, with all its consequences. 9. Syphilis, tuberculosis, and rickets have been assigned as causes of hydrocephalus, but such have never been proved; the cause is yet unknown. 10. Sometimes zones of new osseous material are scattered here and there in the meninges, and sometimes upon or in the brain-substance. 11. The septum lucidum is invariably thickened, as are the cerebral meninges in general. 12. Probably the greater number of cases of early hydrocephalus, whether of the third, fourth, fifth, or lateral ventricle or of the arachnoid variety, can be cured by some form of drainage. 13. Continuous drainage by seton or the repeated use of the trocar has given the best results in the way of benefit or cure. 14. Spinal drainage has been practised in a very limited degree, and its value is as yet undetermined. 15. Subcutaneous drainage has not resulted in a cure, but there seem to be many possibilities for this method. 16. Trephining for drainage is resorted to only in cases in which the fontanels have been closed by bony union. 17. Results from drainage are more favorable if done when the presence of fluid is first detected. 18. It is sometimes necessary to drain both hemispheres, together with the right and left cerebellar cavity. 19. The secret of curing arachnoid hydrocephalus by drainage probably lies in obliterating the arachnoid cavity. However, this can be done with hydrocephalus of the third, fourth, and fifth ventricular variety. 20. The cardinal principle in this, as in all operations upon the brain, is asepsis.

J. Chalmers Da Costa¹ discusses the **surgical treatment of epilepsy** and advises the careful study of the individual case by some one who possesses a scientific knowledge of epilepsy and by an operator who possesses a "surgical conscience." Da Costa thinks that the comparative safety of operations has carried us too far in the application of surgery in the treatment of epilepsy. It is a mistake in this condition to work on the principle that "there must be a lesion and that it is the surgeon's duty to find it." Although at one time the cures of epilepsy by operation were supposed to be from 60 % to 70 %, Da Costa states that it is his conviction that less than 5 % are cured by operation. His conclusions are as follows: "Operations for epilepsy are distinctly disappointing and rarely curative, and are indicated in only a small proportion of cases. They frequently produce temporary benefit. They may save life, but they are not entirely free from danger, and occasionally leave the patient worse than before. The mortality, though small, is not inconsiderable. The actual number of complete recoveries is probably under 5 %. No case should be claimed to have been cured until from 3 to 5 years have elapsed since the operation. Even after operation medical treatment and supervision should be exercised for a long period of time." Da Costa concurs thoroughly with Jacobson, who says: "But while it is authoritatively proved that the value of trephining for traumatic epilepsy has been greatly exaggerated, owing to many operations having been ill advised, and also, what is less excusable, to the premature reporting of successes, it by no means follows that this operation is to be abandoned; it is to

¹ *Medicine*, Feb., 1904.

be employed on more careful and more scientific lines. We should be careful in promising success, save in cases of recent injury, where there has not been time for the changes to occur, which, as we have seen, must render the recurrence of the convulsions after a time a matter almost of certainty. In other cases it will be only honest not to hold out much hope of cure, but to explain to the patient and his friends that the operation is more or less of an experiment; that its dangers are slight in experienced hands; that while cure, in the truthful sense of the word, is unlikely, some relief will almost certainly be granted in the number and the severity of the fits; that in any headache, etc., from which the patient suffers, it is impossible to state what the amount of relief will be until the parts have been explored; and, having said this, we shall be wise if we leave the decision in the hands of the patient or his friends. For as we know nothing of the actual causation of epilepsy in these cases, so we must rest uncertain as to the relief which a trephine opening on wide lines may give. If headache or optic neuritis is present, it will be removed. As to convulsions, we may hope that in cases that are not of too long standing the relief to tension may help toward recovery the impaired vitality of cells so delicately constituted as those of the brain. In other cases the opening may allow of the intracranial circulation undergoing the fluctuations to which it is inevitably exposed, without the unstable cortex centers becoming congested and irritated and prone to explosions, as would otherwise be the case."

Krause¹ reports 4 cases of **nontraumatic Jacksonian epilepsy** which were treated surgically. In one of the cases, that of a girl 16 years of age, operated upon in 1893, a large cyst in the lower face center was drained. There has been no recurrence of the epilepsy since the operation and the patient's mental development is greatly improved. The other cases all showed improvement, but were operated upon more recently. This paper was discussed by Braun, Künnel, and Jolly, all of whom admit the temporary improvement from operation in cases of Jacksonian epilepsy, but state that permanent good is extremely rare.

S. D. Hopkins² (Denver) presents a preliminary report of 5 cases of **epilepsy treated by bilateral excision of the superior and middle cervical ganglions**. These cases were operated upon by Leonard Freeman. One of the cases, that of a man 26 years of age, is considered a cure, as he has been free from epilepsy for a period of 2 years and 1 month. The subsidence of the attacks after the operation was gradual. After the removal of the ganglion the following symptoms were found in every case: "Congestion of conjunctivas and face, ptosis, increased flow of nasal mucus, and a decrease in the pulse and respiratory movements, the former decreasing from 5 to 35 beats when the ganglions were divided. The voice became husky, and the patient complained of pain along the ramus of the lower jaw. The symptoms resulting from the operation and continuing permanently were ptosis, contraction of the pupils, with paresis; tension of the eyeball was minus and the eyeball

¹ Proc. German Surg. Cong., 1903; Ann. of Surg., Dec., 1903.

² N. Y. Med. Jour., Mar. 5, 1904.

receded. Emaciation of the facial muscles was not observed in any of these cases." In the other 4 cases the severity and number of epileptic attacks were lessened sufficiently, it is thought, to warrant the performance of this operation in similar cases.

Wm. P. Spratling,¹ of the Craig Colony for Epileptics, of Sonyea, N. Y., discusses at great length the **results of brain surgery in epilepsy and in congenital mental defects**. Spratling refers extensively to the literature of the subject and reports a large number of cases. His concluding remarks are as follows: "If the epilepsy is general and of some years' duration, we need scarcely expect a cure, though in selected cases operation may ameliorate the symptoms to a marked extent—temporary amelioration being oftener obtained than that which is permanent. If the epilepsy is unessential, reflex, rudimentary in type, or of short duration, and the operation removes the cause early enough, we may expect the convulsions to cease in many cases, provided the patient is free from the vices of heredity that are always beyond the reach of the knife. We fail to find a single case of congenital mental defect in which a normal mental status was established through surgical intervention. We find many reports of cases benefited,—the degree not being given,—so that it is extremely difficult to judge of specific results in any case. The fact that such operations are so few now as compared to what they were 10 years ago is the strongest argument against its utility in the great majority of cases. It may still be used in isolated cases of idiocy, but it seems clear that it is slowly finding its position in rational treatment along a plane far lower than seemed possible at the time of its inauguration."

J. Chalmers Da Costa discusses at length the **surgery of idiocy and insanity**.² The treatment of these conditions is discussed under the following heads: 1. Operations for microcephalic idiocy. 2. Operations for hydrocephalic idiocy and imbecility. 3. Operations for epileptic insanity. 4. Operations for paresis. 5. Operations for ordinary nontraumatic insanity and paranoia. 6. Operations for hypochondriac delusions. 7. Operations for hallucinations. 8. Operations for traumatic insanity. 9. Gynecologic, abdominal, genitourinary, and nasal operations on the insane. The following are his conclusions regarding the treatment of *microcephalic idiocy*: "1. Microcephalus is not the result of premature sutural ossification. 2. A microcephalic brain is not a more or less normal brain of very small size, the idiocy resulting from the smallness of the parts present, but is always an abnormal and undeveloped and, in a great many cases, a diseased brain. Large areas of it may never be developed; and the cells that are present are small and comparatively few in number. 3. In idiocy not only the brain, but the entire organism, is in a condition of general undevelopment. 4. If a strip of bone is removed from the skull, new normal cells will not be produced. Parts that are entirely absent cannot be created, and powers that do not exist cannot be called into being.

¹ N. Y. Med. Jour., Sept. 19 and 26, 1903.

² Jour. Nerv. and Ment. Dis., June, 1904.

The operation cannot bring about these changes any more than it could give sight to the blind idiot or hearing to the deaf one, or could make the inelastic skin of the idiot elastic. 5. The reported improvement after this operation is not due to the surgical procedure. Many cases have been reported at too early a date; numbers of those in which improvement is said to have taken place have not continued in this improved condition, and some patients have been made worse. When the improvement has continued, this has been due to proper instruction and care and not to the operation. Sometimes, also, the alleged improvement has been due to the passing away of a maniacal attack. 6. In uncomplicated cases the operation is never justifiable; its mortality is nearer 15 % than 2 %, as alleged. 7. The proper treatment for microcephalus is educational, hygienic, and disciplinary. What activities the brain possesses should be trained, guided, directed, and controlled. 8. Certain complications may arise that would make trephining justifiable: for instance, certain forms of epileptic seizures, muscular spasm, muscular rigidity, or paralysis. The operation may relieve such a complication and contribute to the patient's comfort, but it will not benefit the mental condition. 9. In traumatic idiocy or in cases of idiocy in which definite pressure-symptoms arise, operation may be justifiable." When one contemplates the hopelessness of *hydrocephalic idiocy and imbecility* and the early death that is likely to ensue from these conditions or the almost inevitable failure of the mind to develop, one is justified in taking considerable risk if there is any hope of improvement. Simple strapping of the head with adhesive plaster rarely accomplishes any good and produces considerable pain. After any form of drainage, however, strapping is of benefit. After referring to the various forms of drainage of the ventricles in this condition, DaCosta states that he believes the method by McArthur, of Chicago, which consists in the introduction of a metal tube into the lateral ventricle which drains the fluid underneath the scalp, which is closed over the mouth of the tube, probably has more to commend it than any other method of procedure, and that it is less likely to be fatal. One of the particular advantages of this operation over the extensive drainage operations is that there is much less likelihood of infection. Operations for *epileptic insanity* are even less promising than in those in which the insanity does not exist as an accompaniment of the epilepsy. Nevertheless, it is justifiable to operate if there is evidence of head-injury; and the procedure may at least lessen the number and the violence of the attacks. If there are focal seizures, one is justified in proceeding as one would for focal seizures in ordinary epilepsy. If status epilepticus exists, one should trephine to relieve pressure; but in the insanity that may accompany ordinary essential epilepsy, no operation of any sort is of the slightest avail. Operations for *paresis* have now practically been abandoned, since there seems to be no evidence that increased pressure is a constant factor in paresis. However, in a case in which convulsive seizures are marked and frequent and in which there is evidence of exaggerated intracerebral pressure, operation may occa-

sionally retard the progress of the case; but in a hopeless and incurable disease, such as paresis, one may, even granting this belief to be well founded, with reason inquire, "Cui bono?"

In cases of *ordinary nontraumatic insanities and paranoia* it is perfectly useless to attempt any operation with the idea of curing the insanity, although the operation may be justified by the existence of some distinct symptom indicative of local brain trouble. In spite of the attitude of some authorities to the contrary, Da Costa does not think that operation in cases of *hypochondriacal delusions* should be undertaken. Mallet has reported a number of operations in such cases, but from a study of these cases it may properly be concluded that there is practically no evidence that operation is indicated. Surgical procedures for *hallucinations* are also condemned. *Traumatic insanity* may be divided into 2 classes: To the first class belong those cases in which the traumatism has caused no gross lesion, and in which, on account of trivial shock, mental or physical, the patient has developed a distinct neurosis, on the basis of which a psychosis has been constructed. In this group of cases operation is not to be thought of. In the second group are found cases in which the injury is the direct and sufficient exciting cause of the condition. Here the insanity may develop at once or some time after the injury—usually some weeks or months. Da Costa has devoted considerable study to this second group of cases, and believes that traumatism is the direct cause of insanity in not more than 2 % of the cases. It is not believed that traumatism produces any special type of insanity. In regard to operation in such cases it is said that: "In a case in which insanity has soon followed a head-injury, if the site of the trauma is indicated by a scar, a depression of bone, local tenderness, fixed headache, or some localizing symptom,—motor or sensory,—operation should positively be undertaken. In a case in which the insanity has developed later, in which the intermediate period between the injury and the development of the insanity has shown the change from the normal mode of thinking and way of acting previously alluded to, and in which the site of trauma is indicated by any of the evidences mentioned above—operation should positively be performed. One should not operate upon a case simply because there is a dubious record of an antecedent fall or blow, which merely suggests the possibility of a traumatic origin for the insanity. In any case in which there are positive signs of increased pressure it may be considered proper to trephine as a palliative measure." In regard to *abdominal, gynecologic, and genitourinary operations on the insane* DaCosta lays down the absolute rule that no surgeon should remove a healthy organ because visceral delusions exist. In this field of surgery there have been a large amount of experimentation and some extraordinarily good results reported. Where there is distinct disease of an organ, the insane patient should be entitled to the same treatment that the sane patient is, but not with the idea of curing his insanity. DaCosta says:

"In spite of these commendatory remarks from various specialists,

I still believe that it should not be the rule to perform operations upon the abdomen, the genitourinary organs, or the nasopharynx with the hope of curing the insanity; but I freely admit that such operations should be done when the disease is of sufficient severity to call for interference, and that in some cases the performing of such operations may be followed by improvement in the mental condition."

George Woolsey¹ presented a contribution to the **surgery of cerebral tumors**. He has collected and analyzed 101 cases of cerebral cysts and tumors which have been operated upon and reported during the past 5 years. These cases have been collected from the English, German, French, and American literature. After discussing the subject, Woolsey reaches the following conclusions: "1. The sphere of operation for cerebral tumors may be and has been extended to those parts of the cortex where tumors are accessible and localizable—i. e., to the prefrontal, parietal, and occipital regions, in addition to the motor area. 2. The prognosis, both immediate and remote, is as good as or even better than in operations for malignant growths in some other locations. 3. This prognosis has improved with the improvements in localization and operative technic and with the limitation of the radical operation to cases accurately localized. 4. The palliative operation is strongly indicated to relieve symptoms when localization cannot be accurately made or the tumor cannot be removed. The exploratory operation is contraindicated. 5. Practically all circumscribed growths of moderate size are suitable for operation. 6. The osteoplastic method should be employed and the most rapid and perfect technic adopted which the circumstances allow."

Charles H. Frazier² presents a discussion of the **treatment of tumors of the brain with a review of the operative records of 4 craniotomies**. Particular attention is paid to the technic. The following is a summary of his remarks:

"1. All measures recognized as prophylactic of shock should be observed stringently. In these we have the most effectual means of reducing the mortality. The most important of them are: (a) The avoidance of prolonged operation; (b) the prevention of excessive hemorrhage; and (c) the avoidance of unnecessarily rough manipulation of the brain-substance. 2. A given area of brain can be exposed with a minimum degree of traumatism and greatest economy of time by the electric engine. 3. Temporary closure of the carotids in operations upon the brain is ineffectual and not unattended by danger. It should be reserved for extreme cases, and practised on one side only. 4. Observations should be made upon the blood-pressure immediately before and at frequent intervals during the operation. Object of same twofold: (a) as the most reliable index of patient's condition; (b) as the only exact method of determining whether operation should or should not be carried out in 2 stages. 5. Two-stage operation is indicated when there has been a decided fall in blood-pressure after the relief from intracranial tension, such as follows reflection of the Wagner flap and dura. 6. Lum-

¹ Am. Jour. Med. Sci., Dec., 1903.

² Am. Jour. Med. Sci., Feb., 1904.

bar puncture as a means of relieving pressure is a temporary, not to say dangerous, procedure. 7. Bulging of the brain is one of the most embarrassing features of cerebral operations. A distinction may be made between that which occurs immediately after reflecting the dura, 'initial' bulging, and that which follows as a result of subsequent exploratory manipulation, 'consecutive' bulging. 8. Initial bulging is due to the increased tension exerted by a tumor. It is not always present, is often not excessive, and is not likely to be followed by 'consecutive' bulging. 9. 'Consecutive' bulging is due to the cerebral edema set up in normal brain-tissue by trauma inflicted by the exploratory manipulations. 'Consecutive' bulging far exceeds in magnitude initial bulging, and suggests the absence of a tumor of considerable size at the seat of operation. 10. In order to avoid this 'consecutive' bulging, which is a most embarrassing feature of these operations, exploration should be carried out in the most expeditious manner. 11. When the edges of the dural wound cannot be approximated without undue tension or without great laceration of brain-substance, the gap should be closed by a graft taken from the pericranium, providing the tumor has not been found and there is reason to question the accuracy of the diagnosis. 12. When there is every assurance of a tumor being present, but it proves to be inoperable or was imperfectly localized, no attempt should be made to close the dura, as in so doing the best possible palliative effects of the operation would be counteracted. 13. Palliative operations should be regarded not merely as operations of propriety, but should be considered imperative whenever the tumor cannot be found or cannot be removed. 14. A statistical study of the results of the last 5 years is encouraging. The mortality, both immediate and subsequent, has been reduced materially. Recurrence after operations for malignant growths of the brain is no greater than after operations for malignant growth of other structures."

Harvey Cushing¹ reports a **successful case of removal of an intradural tumor of the cervical meninges** in which there was a remarkably prompt restoration of function following the operation. The number of such cases has been extremely rare. The patient was a man, 30 years of age, who 18 months before admission to the Johns Hopkins Hospital began to have pain in the flexor muscles of his left forearm. It increased in severity and extended to the region of the left shoulder and back, and the movements of the neck became painful. After a few months the pain became less acute, but the patient suffered from any sudden or forcible movements of the neck, such as occurred in sneezing, laughing, or yawning. These movements caused sharp pain to shoot down through the arm. Early in 1903, about 6 months from the beginning of the symptoms, he developed some weakness in the left leg and dragging of the foot. In August, 1903, he was in bed for 10 days with a high fever, which was supposed to be typhoid. Since this date he was unable to work because of aggravation of his symptoms. There were absolutely no specific history and no reactions to tuberculin. An examination of the patient

¹ Ann. of Surg., June, 1904.

showed marked interference with sensation and motion in the left arm and leg. The areas of anesthesia increased during the patient's stay in the hospital. There was a marked tendency to subnormal temperature. The deep reflexes at knee and ankle on both sides were exaggerated, and a clonus was easily elicited, especially on the left side. The reflexes of the left forearm were also exaggerated. Cushing operated on November 19, 1903, exposing the cord by a laminectomy involving the sixth and seventh cervical vertebrae and the first dorsal vertebra. The dura was abnormally tense and vascular, and there was an unusual dilation of the median posterior vessels. When the dura was incised, a quantity of fluid escaped. On withdrawing the edges of the dural incision the transparent arachnoid bulged into the opening like a distended bubble. When this was punctured, fluid spurted from the opening in jets corresponding to the cardiac and respiratory rhythm. The arachnoid was then incised as far as the opening in the canal, and a small tumor was observed compressing the cord to the right. The cord was somewhat flattened and much more vascular than usual. The lower pole of the tumor was easily enucleated. Across the upper portion ran one of the spinal roots, which was divided. It was impossible, however, to remove the whole tumor without a division of the lamina of the fifth cervical vertebra. When this was done, the mass was readily enucleated. The wound was closed without drainage and healed without complication. So soon as the next day marked improvement in the muscular action of the affected side was noted. From this time on there was a gradual subsidence of all symptoms, and the patient was able to leave the hospital on December 6, 4 weeks after the operation, to all appearances perfectly well. The only evidence of any preëxisting trouble was a slight wasting of the muscles of the left hand. The strength in this hand, however, had greatly increased since the operation. The deep reflexes remained active, and there was also some slight hyperesthesia remaining in the index and middle fingers of the left hand. In February, 1904, the patient was again examined and found to be perfectly well. He was as strong as ever, and had gained 18 pounds. There was no difference in the appearance of the two hands and the muscles seemed equally developed. The hyperesthesia of the fingers had gradually disappeared. An examination of the tumor showed it to be a fibrosarcoma with hyaline degeneration. In its original state it measured about 4 cm. in the long axis. The growth had a smooth outline and a delicate capsule. It was soft, quite vascular, and the surface on section was moist and of a grayish-pink color. Cushing submits a summary of cases of intradural tumor which have up to the present time been successfully operated upon.

A. G. Silcock¹ reports an interesting case of **hernia cerebri following a compound depressed fracture of the skull** in which, after a failure of all other means, he resorted to removal of the mass on two separate occasions. After the first operation the improvement was but temporary, the protrusion getting larger than it had been at the time of this operation, when it was about the size of a tangerine orange. The

¹ *Lancet*, Mar. 26, 1904.

mass protruded a little to the right of the right frontal eminence, involving the intellectual portion of the brain. Following the first operation there was a slight facial palsy. The growth was removed a second time with a hot electric wire. No bleeding followed and the wound healed satisfactorily. There was, after this operation, however, a more marked palsy, which later disappeared. There was also a gradual increasing edema of the right side of the face and neck, which attained its maximum on the fourth day and which gradually subsided. The patient at the last report was in excellent health and showed an active intelligence.

J. A. Macdougall¹ discusses the **prophylactic use of morphin in cases of severe cerebral injury**, reporting 3 cases in which the use of this drug proved most beneficial. MacDougall refers to his former prejudice against the use of morphin in cases of cerebral injury, but he has been entirely converted to its use in these cases. He argues as follows: "If opium, by its action on the nervous system, quiets brain-cells and lessens the functional activity of the nervous fibrils which connect them with one another; if it lessens pain and removes the effects of peripheral stimuli; if it contracts cerebral arterioles and through the cardiac ganglions renders the heart's action slower and vascular pressure less pronounced, then its effects upon a brain that is traumatically damaged and that demands quiet for its repair can only be beneficial."

John B. Murphy² (Chicago) describes a case of **trigeminal neuralgia treated by intraneural injections of osmic acid**. The patient was a man, 76 years of age, in very poor health. For a number of years he had suffered from tic douloureux, especially involving the ophthalmic branch. It was thought that the peripheral operations would give but temporary relief and that the intracranial operations were contraindicated by the patient's general health. Murphy, therefore, determined to try the intraneural injection of osmic acid as recommended by W. H. Bennett, of London. He followed Bennett's technic closely, the supraorbital and inferior orbital branches and the mental branch being exposed and injected with 5 or 10 minims of a fresh 1.5 % solution of osmic acid. The ordinary hypodermatic syringe was used for the injection. He was careful to make several injections at different points, in order to be sure that every fiber was reached. He also injected a small quantity of fluid between the nerve and its sheath and the bony canal. Wherever the solution comes in contact with the blood or soft tissues an immediate blackening results, due to the formation of osmium hydroxid. Healing is not interfered with by the action of the acid on the tissue, but care is taken to protect the skin. The pain had entirely disappeared a few hours after the operation, and a report received one month after the patient's discharge from the hospital stated that there had been no recurrence of the pain. The acid probably acts in one of two ways, or possibly in both: first, by producing a degeneration of the nerve on the proximal side of the injection, toward the ganglion; or,

¹ Lancet, June 25, 1904.

² Jour. Am. Med. Assoc., Aug. 22, 1903.

second, by causing a local destruction of the nerve and its terminal filaments. The first explanation is the one which most appeals to Murphy.

Poirier¹ reports a case of *tic douloureux* occurring in a man, 53 years of age, in which the condition was absolutely relieved by the **removal of the superior sympathetic ganglion of the neck** on the affected side. Six months have transpired since the performance of the operation, without a recurrence of pain. In discussing this paper Delbet reported a case in which he had performed this operation after a recurrence of the neuralgia following the removal of the Gasserian ganglion. Following it there was a gradual subsidence of the pain until it finally disappeared entirely. Ultimately, however, the pain recurred and was as violent as ever.

Keen and Sweet² report a case of **gunshot wound of the brain in which the röntgen rays showed the presence of 8 fragments of the bullet**. These were localized by Sweet's method, which is described. Several cuts are also introduced, showing an improved apparatus for the localization of foreign bodies by the röntgen rays. The case reported is that of a boy, 15 years of age, who was seen 6 months after the receipt of his injury. Two or 3 days after the accident the left leg had become entirely paralyzed and the patient had half a dozen severe epileptiform convulsions, which ceased after the administration of bromid and chloral and did not recur. He gradually improved, the paralysis disappearing nearly altogether. The only difficulty at the time Keen saw him was a slight weakness in the left leg and foot. Sweet made skiagraphs which showed the main portion of the ball to lie vertically 5 cm. below a point 2.5 cm. to the right of the middle line, and 1.5 cm. back of the fissure of Rolando, on a line parallel with the middle line. Sweet indicated a point on the top of the head corresponding practically to the bullet, and also one above the ear which represented its depth. As the patient was gradually improving and gave every prospect of an absolute recovery, and as the fragments of the ball were situated so deeply, Keen determined not to operate but to indicate definitely the location of the foreign body in case of future trouble. This was done by producing a small scar and bald spot by excising the hair-follicles at the points already indicated. The latter part of the paper consists of a description by Sweet of his method of localization and of his apparatus.

In his 3 Hunterian lectures T. Crisp English³ discusses the **after-effects of head-injuries**. The subject is very thoroughly dealt with and the following conclusions reached: "1. While some degree of mental impairment is comparatively common after injuries to the head, the changes are seldom sufficiently marked to be included under the heading of insanity. 2. Insanity may result from injury to any part of the head. 3. Traumatism leads to insanity in 2 ways: (1) direct insanity due to the actual injury to the brain or its membranes apart from heredi-

¹ Bull. et Mém. de la Soc. de Chir., 1903, No. 26.

² Am. Jour. Med. Sci., July, 1903.

³ Lancet, Feb. 20, 27, and Mar. 5, 1904.

tary or other predisposing causes; and (2) indirect insanity—that is to say, any form of insanity occurring as the result of lowered resistance of the brain due to injury in patients with a predisposition to insanity, hereditary or otherwise. 4. Every variety of mental change may be produced by traumatism, although some forms are commoner than others. 5. It is at present undetermined whether injury to the pre-frontal region is more likely to be followed by mental disturbances than injury to other parts of the brain. 6. Only a small proportion of the cases of traumatic insanity are open to relief by operation, for a localizing indication in an accessible region must be present. 7. The results so far have been encouraging, and although the operation must necessarily be exploratory, it is fully justified in suitable cases, especially in face of the otherwise hopeless condition of these patients."

Wallace and Marriage¹ report a case of **attempted division of the eighth nerve within the skull for the relief of tinnitus**. The patient was a woman, 23 years of age, who 6 years previous had had otitis media. This was followed by mastoid abscess, for the relief of which numerous operations were done. The patient was finally left with a most distressing tinnitus, which was so marked as to prevent her sleeping and accompanied by a vertigo which rendered it unsafe for her to go about alone. The authors determined to expose and divide the auditory nerve within the skull. They first performed the operation upon a cadaver, and determined that the best method of approach was that which consisted in continuing the ordinary operation for mastoid caries upward until the posterior surface of the petrous bone was exposed. When this was attempted, there was such free bleeding from the sinus that it was packed and the operation completed a week later. Little difficulty was encountered in exposing the auditory and facial nerves, but a continued view of them was rendered difficult by the constant flow of cerebrospinal fluid and blood. However, a hook was finally passed under the auditory nerve and it was divided by traction. The patient's tinnitus was greatly relieved by this operation, but continued to some extent for some days. The wound, however, showed no tendency to heal and cerebrospinal fluid continued to escape. The patient grew weaker and died 21 days after the operation. A careful necropsy was made, but no inflammation of the meninges was encountered. It was found that a small thread of the nerve had not been torn across. This case shows the possibility of division of the auditory nerve within the skull without injury to the facial nerve. The authors cannot find any satisfactory explanation of the death, but believe it was largely due to the poor condition of the patient before operation.

Farrar Cobb² reports a case of **recurrent dislocation of the ulnar nerve** cured by operation, together with a summary of 15 other operative cases gathered from the literature. Recurrent dislocation of the ulnar nerve may be nontraumatic—that is, a so-called habitual, congenital, or idiopathic type—or it may be traumatic. Cases of the first class are much more numerous, but the symptoms are rarely severe enough to

¹ Lancet, Apr. 30, 1904.

² Ann. of Surg., Nov., 1903.

require operation, yielding to simple palliative treatment. In the collected cases all were of traumatic origin, with two exceptions. Cobb points out that abnormal motility of the ulnar nerve is not uncommon, and may be present to the extent of forward dislocation without producing symptoms. Colinette, in an examination of 500 persons, found that the nerve could be completely dislocated in front of the internal condyle on flexion of the forearm in 13 instances, and in 5 of these the dislocation involved both nerves. Drouard found complete luxation in 3 out of 200 patients, and Cobb, in an examination of 150 large and well-developed men, found one case of complete dislocation forward. The dislocation takes place when the forearm is flexed. One of the characteristic symptoms is darting pains in the distribution of the nerve, and is thought to be caused by the oft-recurring excursions or jumps over the condyle, and that sooner or later pathologic changes take place in the nerve and its sheath. In most of the cases operated upon the nerve was found distinctly enlarged and fusiform in shape. In one case—that of Andrae—a microscopic examination of the nerve was made which showed a typical neurofibroma with marked thickening of the nerve-sheath. The practical conclusions from an examination of the literature on this subject is that idiopathic dislocation is not uncommon, but that, as a rule, the symptoms are not serious enough to demand operation. Cobb's case was that of a man, 52 years of age, who 2 years previous struck the inner side of his left elbow violently against a post. This was followed by considerable swelling, which subsided under treatment. About a month later, however, the patient began to develop disabling pains inside of the elbow and down the inner side of the forearm into the inner fingers of the hand. Numbness of these fingers had been present constantly for a year. During the previous 12 months also the patient discovered that pain and tingling sensations were caused by flexion of the forearm, and himself located the injured nerve. For 6 months he had been unable to do any kind of work. Examination of the joint showed no evidence of fracture, but the injured ulnar nerve could be easily felt. On flexion of the forearm past a right angle the nerve rolled over the tip of the internal condyle, and on complete flexion it was distinctly felt in front of the condyle. This movement produced a good deal of pain. An internal splint was applied for 3 weeks, during which time the patient was perfectly comfortable, but on its removal the symptoms returned. The nerve was then exposed and found to be very much enlarged and very superficial. Its normal groove back of the internal condyle was filled with muscle-fibers, evidently a portion of the triceps. The exposed portion of the nerve was fusiform in shape and as large as a lead-pencil in the thickest portion. The so-called arcuate ligament, which normally passes over the nerve and holds it in position, was not present, and it was thought that at the original injury the fibers and muscular structures back of the internal condyle had been torn. A groove was made for the nerve and it was fixed in this position by suturing a portion of the fascia of the triceps over it. The wound healed by first intention; all splints and dressings

were removed at the end of 4 weeks, at which time the nerve could be no longer felt and there was none of the old pain on flexion or any tenderness on pressure. Two years and a half after operation the patient was perfectly well and able to use his arm in any manner.

Hackenbusch¹ (Wiesbaden) reports a case of a girl, 8 years of age, who had suffered from facial paralysis for $7\frac{1}{4}$ years. Hackenbusch **implanted two-thirds of the spinal accessory nerve into the facial.** There was considerable improvement after $4\frac{1}{2}$ months, and after 9 months the child could voluntarily draw the right angle of the mouth downward. Encouraged by this result Hackenbusch, in a case of infantile spinal paralysis, implanted one-third of the tibial nerve into the perineal nerve, which was completely paralyzed. Some improvement, especially regarding the equinus, had taken place. Körte, in discussing Hackenbusch's paper, showed a patient in whom, $1\frac{1}{2}$ years previously, he had **anastomosed the peripheral stump of the facial nerve to the hypoglossal,** with much benefit. He believes, however, that the accessory nerve is better as a graft than the hypoglossal. Dollinger advises against dividing the accessory nerve before it passes through the sternomastoid, as otherwise an irremediable paralysis and atrophy of that muscle may result.

John A. Wyeth² records a case of **complete paralysis of the entire upper extremity from stretching of the axillary plexus over the head of the humerus in an operation for the removal of tuberculous glands of the axilla.** This palsy was undoubtedly due to the cause assigned, namely, the overextension of the arm causing a stretching of the nerves over the head of the bone. The palsy was complete as regards both motion and sensation. No improvement was noticed until 6 weeks after the operation, when sensations of numbness and slight shooting pains were noticed. These were followed by a gradual improvement, and 5 months after the operation the patient's arm was perfectly normal in every respect.

Tubby³ describes a method of **treating paralysis of the upper root of the brachial plexus (Erb-Duchenne type) by operation.** This palsy arises from difficulty at birth, fracture of the clavicle, injuries about the shoulder, infantile paralysis, etc. The muscles implicated in this palsy are the deltoid, infraspinatus, biceps, brachialis anticus, and supinator longus. The patient is unable to flex the elbow or to abduct the arm. There is a loss of sensation in the areas supplied by the circumflex and musculospiral nerves. Tubby knows of no attempt which has been made in these cases to perform nerve-grafting, and thinks it is difficult to say what would be the result of attaching portions of the sixth or seventh nerve-roots to the fifth. Muscle-grafting would appear to be the best method to follow, and it is this which Tubby has practised successfully in 2 cases. The restoration of flexion of the elbow was accomplished by detaching a portion of the outer head of the triceps from the rest of the muscle and attaching its extremity to the biceps tendon, the elbow

¹ Proc. German Surg. Cong., 1903; Ann. of Surg., Dec., 1903.

² Jour. Am. Med. Assoc., June 25, 1904. ³ Brit. Med. Jour., Oct. 17, 1903.

being kept in a position of complete flexion while the wound was healing. In both cases the power of voluntary flexion of the elbow returned in from 4 to 6 weeks. Tubby finds it better to do this operation at one sitting and the operation on the shoulder at the next. The abduction of the arm was accomplished by detaching a portion of the pectoralis major and a portion of the trapezius, uniting the two extremities and attaching them to the deltoid muscle. If the tongue formed by the two muscles is not long enough to be inserted directly into the deltoid, it is recommended that it be attached to a portion of the periosteum of the humerus.

H. M. W. Gray¹ (Aberdeen) describes a case of **musculospiral palsy**, in which he operated 2 years after its establishment. The paralysis was absolute and there was no chance of repair of the nerve. He, therefore, attached the tendon of the flexor carpi ulnaris to the tendon of the common extensor of the fingers. He thought that it would take some time to educate the flexor muscle to perform extension of the fingers, and was therefore much surprised when the cast was removed to find that the patient at once was able to extend the fingers. Of course, the palsy of the thumb was not overcome by this operation, but Gray intends later to attach the tendon of the flexor carpi radialis to the extensor tendon of the thumb. Restoration of extension was most satisfactory and complete.

DISEASES OF THE MUSCLES, FASCIA, ETC.

Tenosynovitis of the abductor pollicis is discussed by Marion,² who reports 6 cases which came under his observation within a period of 7 months. It is stated that this is a condition which has not received much consideration in surgical literature, and one which is frequently incorrectly diagnosed. In all the 6 cases the symptoms were similar. These were, first, pain when the thumb was moved, and especially when it was abducted; tenderness localized over the extensor surface of the styloid process of the radius; and swelling in this region, varying in size and usually elongated in the direction of the tendon. This swelling was hard and resembled bone. Fluctuation could be elicited in no case. It is this character of the swelling which renders an incorrect diagnosis easy. It is thought that the great hardness of the swelling is due to the resistance offered by the fibrous sheath. The condition may be differentiated from tuberculous disease of the radius by the elongated shape of the swelling, its localization, and the pain in the thumb when it is moved. In each of the cases reported a cure resulted after blisters and compression.

C. L. Scudder and W. E. Paul³ (Boston) report a case of **rupture of the tendon of the extensor longus pollicis**. It was believed that the tendon was nearly completely divided by a blow on a stone step, and that 3 weeks later muscular action completed the rupture, with

¹ Lancet, May 21, 1904.

² Arch. gén. de Méd., Aug. 4, 1904.

³ Boston M. and S. Jour., Dec. 10, 1903.

immediate loss of function. An operation was done 6 weeks after the loss of function, and the diagnosis confirmed. The ends of the ruptured tendon were 6 or 7 cm. apart, and approximation of them was impracticable. The distal portion of the tendon was then united to a portion of the extensor carpi radialis. The patient made a good recovery and was able to extend the distal phalanx, which he could only flex before. A careful examination of the symptoms presented in this case shows that the extensor longus pollicis is the most important extensor muscle of the thumb, and that the extensor brevis pollicis acting alone has very feeble extensor control over the first phalanx.

Henry R. Wharton¹ (Philadelphia) reports a case of **simultaneous rupture of both quadriceps extensor femoris tendons**. The patient was a man, 60 years of age. He was not seen by Wharton until one month after the receipt of the injury. From the fact that the patient was unable to extend the legs and presented the other signs of rupture of the quadriceps tendon, a diagnosis was easily made. Wharton operated upon this case, freshening the ends of the tendons and uniting them with chromicized gut sutures. There was noticed a bony deposit in the tendons which was probably a predisposing cause of their rupture. The point of rupture was $1\frac{1}{2}$ inches above the insertion of the tendons into the patella. The wounds healed primarily and there was a complete restoration of function.

H. G. Stetson² deals with the subject of **rupture of the quadriceps extensor femoris muscle**, and reports a case occurring in a man, 71 years old. The muscle was ruptured in an attempt to prevent a fall downstairs. The diagnosis of rupture of the tendon was easily made by the position of the patella, its movability from side to side, by a marked depression above the bone, and by the condyles of the femur being plainly felt. Further up the thigh an abnormal prominence could be felt which was the upper end of the torn muscle. On account of the patient's age and a marked arteriosclerosis it was deemed advisable not to operate, and the leg was, therefore, dressed upon a posterior splint. For about 7 weeks the leg was kept fixed, but then massage and passive motion were begun. About 4 months after the injury he had entirely recovered the function of the leg and was able to extend it forcibly. He was in nowise inconvenienced and is not lame. Stetson refers to the previous literature on this subject, points out the rarity of the injury, and discusses its pathology. The rupture usually takes place at the upper margin of the patella, though it may occur higher up. The symptoms are characteristic and a diagnosis is easily made. In addition to the signs already mentioned there is, of course, loss of the power of extension. The results from operative interference have been better than those where no operation has been performed, but unless the circumstances and surroundings are such as to render the operation an absolutely sterile one and the operator is experienced, most authorities are agreed that a conservative plan of treatment should be followed.

¹ Ann. of Surg., 1903, vol. xxxvii, p. 459.

² Boston M. and S. Jour., Aug. 13, 1903.

T. Pridgin Teale¹ describes a **suppuration of the bursa over the great trochanter and its occasional imitation of hip-disease**. He first called attention to this condition in 1870. Recently he has seen another case occurring in a man, 51 years of age. Stress is laid upon the following points: "(1) A *prima facie* suspicion of hip-disease; (2) either no marked muscular rigidity and fixity of the hip-joint or, where such exist, their disappearance under an anesthetic; (3) the absence of tenderness on pressure of the head of the femur against the acetabulum; (4) the frequency of the history of a fall on the trochanter; and (5) the effect of the flat tendon of the gluteus maximus as a factor in keeping up the diseased condition of the bursa and the importance of the division of this tendon in the surgical treatment of the disease." Teale also advises teachers to impress the following points: "(1) The importance in many cases of a traumatic and nontuberculous origin; (2) the fact that simulation of hip-disease is at times so close that experienced surgeons may, on first seeing the case, be misled, and even after mature consideration be mistaken; and (3) that, above all things, the division of the flat tendon of the gluteus is a dominant factor in promoting rapid cure."

J. F. Binnie² discusses the question of **myositis ossificans traumatica**. Bone-formation may take place in muscle or tendon under several distinct conditions. It may be progressive, taking one muscle after another, resulting in a condition which causes the victim to be dubbed the "ossified man." This condition is less uncommon, Binnie believes, than is generally supposed. Another type of this disease is that in which bone forms in muscle or tendon as the result of slight continued traumatism, examples of which are "rider's bone," the adductors of the thigh being affected, "cavalryman's bone," an osseous plate forming where the saber hits the outer side of the thigh, etc. A third type, and that to which discussion is devoted, is the so-called myositis ossificans traumatica, where a mass of bone is produced in a muscle after a single injury. Binnie reports a case of a man, 41 years of age, who received a severe bruise on the left forearm and arm while boxing. Following the injury there were considerable swelling and ecchymosis, which later disappeared. Within 2 weeks there developed an increasing tumor at the juncture of the lower and middle thirds of the upper arm, which was painful on extending the forearm. The tumor was elongated, hard, and the size of a large thumb. It was movable from side to side, but not up and down. Three weeks after the receipt of the injury Binnie removed the mass. At its upper end it was attached to the humerus, but was easily separated with the periosteal elevator, leaving an area, one inch square, of humerus denuded of periosteum but not rough. The corresponding surface of the tumor was rough. A considerable portion of the brachialis anticus muscle was removed with the tumor. The wound healed primarily and there was no recurrence 18 months after the operation. The tumor measured 2 inches in length by $\frac{3}{4}$ inch by $\frac{3}{4}$ inch. It was not very hard and could be cut with a knife. The mass

¹ Lancet, Nov. 14, 1903.

² Ann. of Surg., Sept., 1903.

was examined by Frank Hall, who found that ossification was as far advanced in the distal as in the proximal portions; around and throughout the tumor there was great proliferation of intramuscular connective tissue; ossification was both of the fibrous and of the cartilaginous type, and muscle-fibers in every stage of degeneration were scattered here and there, lying in the connective tissue, in among the islands of cartilage, and hugged by the trabeculas of bone. There was no microscopic evidence of any inflammatory changes. Binnie discusses the various explanations which have been offered as to the origin of these intramuscular masses of bone after injury, and apparently deems 3 of them worthy of consideration. The first is that the periosteum is the origin of these bone-developments. The second is the theory of Cahen, which involves the adoption of the famous Colnheim theory of the origin of tumors. The tumor is considered an osteoma, primarily muscular, and any connection with bone of entirely secondary occurrence. He believes that there have been present in the muscle aberrant masses of embryonic material originally provided for the development of normal bone, but unused. The traumatism stimulates these into growth. A third explanation, that of Ziegler, assumes that in patients the subjects of myositis ossificans, whether traumatic or progressive, there is a congenital diathesis of the connective tissue of the muscles, fascia, tendons, ligaments, etc., in that they become endowed with powers normally belonging to the periosteum alone. This theory is closely related to the Reichert notion of the connective tissues. Binnie has collected a large number of cases from the literature and a number which have never been reported.

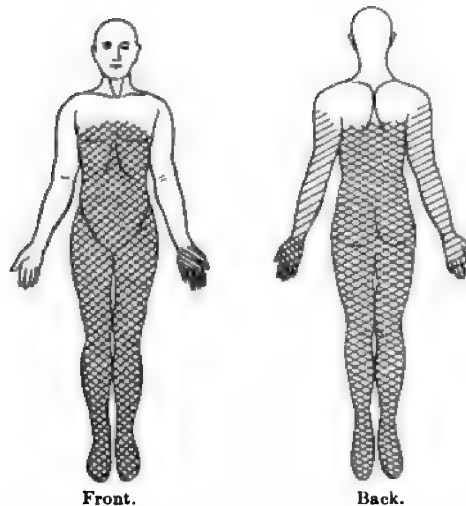
D. D. Scannell¹ reports a **unique case of posttyphoidal myositis of the rectus abdominis**. The patient was an Italian, 9 years of age, who was admitted to the Boston City Hospital suffering from typhoid fever. The disease was complicated by varicella and later by a severe furunculosis. Later in the disease there also developed an ischiorectal abscess. In none of the boils nor in this abscess could the typhoid bacillus be found. Five days after his discharge from the hospital he returned, suffering from chills, fever, occasional nausea and vomiting, and considerable abdominal pain. The abdomen was slightly distended, and there was considerable muscular rigidity. Movements of the diaphragm and extension of the thighs increased the localized pain in the right lower quadrant. A diagnosis of acute perforative appendicitis with abscess-formation was made, and the patient was operated upon by Blake, who made the muscle-splitting incision of McBurney. The appendix was found normal, as were the remainder of the abdominal organs in the neighborhood. In the lower third of the right rectus there was found an ovoid, indurated, nonfluctuant thickening. The appendix was removed, but no steps were taken to incise the indurated mass, as it was thought unwise to do so at this time. The patient made a good recovery from the operation, and gradually the indurated mass in the rectus subsided. It is believed that this swelling was a myositis due to typhoid infection. This, it is stated, is a rare condition, and was

¹ Boston M. and S. Jour., Nov. 26, 1903.

not found by either Keen or Osler in their examination of a large number of cases. [A similar case was operated upon by Da Costa, although the symptoms were not nearly so acute and the fever had been gone for weeks. A diagnosis was made in this case of abscess within the sheath of the rectus muscle.]

DISEASES OF THE SPINE AND CORD.

The value of operation in spinal-cord injuries is discussed by Mixter and Chase,¹ who report 2 illustrative cases. The summary of their first case is as follows: High fracture of spine, viz., sixth cervical vertebra. There were present all the classic symptoms upon which authorities have previously based their opinion that operation was contraindicated because it suggested total transverse lesion with a crush of the cord beyond repair. The case was operated upon within 24 hours. The patient lived 11½ months, during which time there was marked



////// = Absence of motion. \\\ = Absence of tactile sense.

Figs. 28, 29.—Area of total paralysis in Mixter and Chase's case of high fracture of the spine (Ann. of Surg., Apr., 1904).

and steady improvement; from a condition of total paralysis over an area represented in Figs. 28 and 29, the patient regained nearly normal use of his hands and arms, and such improvement in the condition of his body and legs as to lead one to believe that if an unfortunate complication had not arisen, further improvement might have been expected. From a condition of total anesthesia over the area above referred to there was practically complete recovery by the ordinary tests. Following death, a series of cross-sections of the spinal cord from the pons to the coccyx makes it possible to study the paths of degeneration following a crush at an unusual length of time after injury. Pathologic

¹ Ann. of Surg., Apr., 1904.

anatomy of the spinal cord shows that descending degeneration of all injured axons occurs in motor tracts below the level of the lesion and of the common tract, which is composed of short descending sensory collaterals from injured sensory neurons; it shows the occurrence of ascending degeneration of all sensory axons involved in the lesion. The sections demonstrate that normal sensory and motor axons exit at the seat of the lesion, though their functions were interrupted at the time of injury, which suggested total destruction of the cord. The operation showed fracture and depression of the spinous processes and laminae, apparently lying against the cord. There was a blood-clot under the laminae, none under the dura; condition of bodies of vertebrae not known. The second case reported is that of a man, 27 years of age, who received an injury of his spine by diving into shallow water. Mixter operated upon this case 2 days after the receipt of the injury. At the time of the operation there were diaphragmatic breathing and complete paralysis of motion and sensation below the level of the lesion; reflexes were absent; apparently a case of total transverse destruction of the cord. The laminae of the sixth and seventh cervical vertebrae were found fractured and depressed, lying against the spinal cord. These laminae were removed, the dura was opened, and no macroscopic lesion of the cord detected. There were no blood-clots, wound closed, healing without interruption. This patient ultimately regained sufficient control of his muscles to engage in business, going about with one cane, and was able perfectly to use his arms for dressing himself, etc. The value of operation in injuries of the spine is enumerated as follows: (1) It removes depressed fragments of bone apparently lying against the cord; (2) it removes blood-clots; (3) allows the escape of exudate and makes room for inflammatory thickening; (4) if extensive hemorrhage is present, either extradural or intradural, it relieves pressure from the cord. Cases in literature have shown that degeneration from pressure appears within 4 days; if a cord is injured by crush and not totally destroyed, the continued pressure of a blood-clot may succeed in completing total destruction; (5) traumatic spinal edema may be of such extent as to demand greater space for enlargement of the cord to avoid further destruction of fibers; (6) there is absolutely no method by which one can early diagnose slight or great pressure of a fragment of bone, the pressure of a small or a large hematoma, whether there is a momentary pinch of the cord or constant pressure; (7) the fact that the cord looked normal in these cases does not preclude the possibility that pressure had existed, nor prove that a condition had existed in which drainage and relief of pressure were not distinctly beneficial; (8) the patients did not suffer from any ill effect of the operation *per se*; the dangers of operation are very slight compared to the possible benefit to be derived therefrom; and the further satisfaction is obtained that the surgeon *knows* that continued pressure does not exist. The symptoms in both of these cases were typical of complete transverse lesion of the cord, which many authorities consider a contraindication to operation. They are striking examples of the fact that typical symptoms of complete transverse

lesions are not infallible, and that the surgeon is not doing all in his power to relieve the patient's condition unless he operates. There are no symptoms which establish, otherwise than by their persistence, an irremediable pressure of the cord. Operation should be done early—within a few hours of the injury, if possible.

L. S. Pilcher and B. Onuf¹ report an interesting case of **perforating gunshot wound of the cervical portion of the spinal cord**. The patient was a boy, 11 years of age, who was accidentally shot by a 22-caliber rifle. The bullet entered in front of the middle line, just below the level of the episternal notch, and ranged upward and backward. The patient, soon after the receipt of the injury, presented a complete motor and sensory paralysis from the level of the wound down. Sensory paralysis was not present, however, over the surface of the right arm and forearm and over a portion of the left upper extremity. There were also involuntary defecation and urination and priapism. No muscles of the foot or leg gave any response to faradism. The patient was injured on July 16, and between that date and August 12, when he was operated upon, there was a marked improvement in his condition. He recovered control of his rectum and bladder and was able to move certain muscles. An anteroposterior skiagraph showed the bullet lodged in the midline between the fifth and sixth cervical vertebrae. It was impossible to get a lateral view, and therefore the exact location of the bullet could not be determined. It was thought that possibly there might be some depression of the bone against the cord, and laminectomy was decided upon. The laminae of the fourth, fifth, and sixth vertebrae were removed, and the cord and canal thoroughly examined. There was no depression of bone which could be felt, and the cord was found normal. The bullet was not encountered, and the wound was closed with drainage, the patient making a good operative recovery, and after the operation his improvement in motion and sensation rapidly progressed. One year after the injury the patient showed marked improvement and was able to walk. A complete report of the patient's condition at this time is submitted by Onuf. A skiagraph taken later and showing the lateral view of the vertebra represents the bullet lodged in the spinous process in the sixth cervical vertebra.

Mackay² (Melbourne) reports a case of **laminectomy for paraplegia**. The patient was a child, 11 years of age. The paraplegia developed gradually until finally it became complete. There was nothing to point definitely to the cause of the condition, but the patient had previously suffered from an osteomyelitis of the humerus, and it is supposed that both conditions were tubercular in origin. A laminectomy was done, involving the fourth, fifth, and sixth dorsal vertebrae. The dura was found normal, and when it was opened, a quantity of cerebrospinal fluid gushed out. The cord looked healthy, and exploration revealed no obstruction. The wound was closed without anything further being done. Suppuration occurred, and for a while the patient was very ill. Later, however, he began to improve, and 6 months afterward a marked

¹ Ann. of Surg., Dec., 1903. ² Intercol. Med. Jour. of Australasia, Dec. 20, 1903.

improvement had taken place. At the time of the report he could walk very well, though there was still some spastic contraction of the left leg. He also had normal control over the bladder and rectum. The following is the explanation presented of this case: "There was a tubercular deposit in the vertebral canal, either extradural or intradural; that it caused compression-paraplegia and ascending myelitis; that the opening of the dura and the evacuation of a large amount of cerebrospinal fluid relieved pressure, and permitted a quick, though partial, restoration of function, and arrested the ascending myelitis; and that the enforced rest and the general treatment have brought about a gradual cure of the tuberculous nodule which originated the symptoms."

John E. Owens¹ (Chicago), after a discussion of **fractures of the vertebrae**, reaches the following conclusions: "1. Laminectomy is superior to a simple reduction of the deformity, since, in fractures of the arches, reduction has no certain effect upon isolated fragments, and reduction alone has hastened death. 2. Reduction may be more rational when effected through the open wound of laminectomy. 3. Simple reduction is useless where there are clots or adhesions sufficient in themselves to account for the spinal disturbance. 4. In cervical luxation without fracture simple reduction has given good results. 5. It is possible still further to improve the prognosis of reduction in simple cervical luxations by making the reduction with the arches exposed and employing silver-wire suture of the processes to prevent relapse. In consideration of the distressing prognosis in lesions of the cervical region an operation appears strongly indicated."

Tinley and A. R. Jones² report a case of **fracture of the fifth cervical vertebra followed by recovery**. The symptoms and signs in this case pointed clearly to a fracture of the vertebra mentioned, and progressed until the patient was in an apparently hopeless condition, being completely palsied, having bed-sores, and suffering from incontinence. A gradual improvement took place, however, after several months, and, he ultimately reached a condition when he was able to walk about and use all his extremities.

J. Leonard Corning³ describes a **method of establishing a permanent way through the bony wall of the vertebrae to facilitate the repetition of intraspinal injections**, and describes a case of **tetanus** in which this procedure was followed. The lamina was exposed and penetrated with a drill. A silver tube was then thrust into the opening down to the membranes. A long, fine needle armed with a glass syringe was then passed into the tube and thrust through the membranes. The injection was then made. This was repeated and a second injection made some days later. In the interval between the injections the silver tube was occluded by a stilet. The patient died of the tetanus in spite of the treatment, but the case was an apparently hopeless one from the beginning.

George G. Davis⁴ (Chicago) reports a case of **sarcoma of the cauda**

¹ Chicago Med. Recorder, Oct. 15, 1903.

² Lancet, Nov. 28, 1903.

³ Med. Rec., June 4, 1904.

⁴ Jour. Am. Med. Assoc., Mar. 19, 1904.

equina occurring in the service of Sippy and operated upon by Bevan. Tumors involving the cauda equina or causing symptoms of pressure on the cauda may arise within the contents of the meninges or in the structures outside of the dural sheath, especially in the vertebral column. Tumors arising within the cauda itself are rare. Those springing from the meninges are less common and their variety is small, sarcoma being the most frequent. The greater number of tumors are extradural, and arise in connection with the bony structures. The case reported belongs to this variety. Sippy has described the following symptoms as typical of a lesion of the cauda equina: "The patient first experiences pain on movement of the lower extremities; then the pain becomes spontaneous and persistent, with exacerbations. Later, anesthesia begins. In a few cases it has been observed that the function of the central fibers were first disturbed when the process was such that a uniform compression of the cauda was produced. Symptoms of disturbance of the functions of the bladder and rectum may appear early and are usually present before anesthesia becomes permanent. Muscular weakness is present in proportion to the pressure on the motor fibers, and, as a rule, does not appear until pain has become pronounced. The paralysis is characterized by loss of muscular tone. An early examination may show exaggerated reflexes; later they are diminished and finally lost. Atrophies of the muscles develop and the electric reactions may be altered; decubitus has been noticed." The involvement of one extremity more than the other, as in Fränkel's case; the slow development of motor paralysis, of sensory disturbances and of other symptoms, and the destruction of reflexes before loss of power are other important symptoms. Sippy, in discussing the differential diagnosis between tumors involving the cauda equina and diseases of the conus medullaris, stated that in lesions of the latter "symptoms develop more rapidly; the various sensory disturbances may not be alike; pain and temperature sensations are more frequently seriously affected than tactile sense. Severe pain is absent, provided the conus lesion does not involve the cauda fibers. Disease of the conus is more likely to cause decubitus than caudal disease. The most important symptom of caudal disease is pain. A conus lesion may be associated with pain, provided the cauda meninges are also involved. The absence of pain is indicative of conus lesion." In the case recorded Bevan operated, but found it impossible to remove the whole tumor. Examination of the portion removed showed it to be a sarcoma.

DISEASES OF THE KIDNEYS AND URETERS.

John C. Munro,¹ in order to ascertain the significance of albumin and casts in surgical patients, examined the records of 4185 cases in the Boston City Hospital, 500 of which showed albumin and casts. At least 60 % of these 500 were etherized, yet there is nothing to indicate that any renal damage was inflicted by the anesthetic. Of the 63 fatal cases, the death in each was due to some other cause than dam-

¹ Med. News, Sept. 12, 1903.

aged kidneys. Munro concludes that we should expect evidence of renal irritation in over one-third of the surgical patients found in a hospital. The mere presence of a trace of albumin, with or without hyaline and granular casts, unattended by other evidence of renal damage, should not influence the prognosis in surgical disease or operation. The presence, however, of albumin and casts should place us on the watch for other and more significant signs of organic degeneration, which may prove serious obstacles to operation or satisfactory convalescence. Albumin and casts alone are apparently no contraindication to the administration of ether. The age at which we must expect albumin and casts in surgical patients is under 35 years in over half the cases. The proportion in young and otherwise healthy children is probably as great as in adults.

Warren A. Dennis¹ reports **a case of solitary or fused kidney** and gives the following summary: 1. According to available statistics, complete absence or extreme atrophy of one kidney is found once in 2650 cases; horseshoe kidney once in 1000 cases; and the fused kidney, exclusive of the horseshoe variety, once in about 16,000 cases. 2. The great majority of fused kidneys are misplaced, being usually in the median line and lower than normal. 3. The completely fused kidney, with normal position and approximately normal outline, is the rarest form of all. 4. Cystoscopic examination, with catheterization of the ureters, will prevent the error of removing the only organ present in all cases, except those of fusion. 5. Horseshoe and irregularly fused kidneys may be recognized on exposure by their abnormal shape or position, or by both. 6. The single remaining and rarest variety, that with normal outline and position, can probably always be at least suspected and left if the ureter and pelvis are found shifted to the anterior surface.

R. E. Weigall² reports a case of **gangrene of the kidney** occurring in a woman aged 23. The symptoms were those of sepsis with a tender mass in the right loin. At operation a gangrenous kidney completely twisted on its axis was exposed and removed. Recovery followed. The immediate cause of the twisting was a blow in the right loin, the right kidney already being movable.

Francis S. Watson³ has collected and analyzed 660 cases of **sub-
parietal injury of the kidney**. There are 11 examples of laceration or serious injury of the kidney by muscular action alone. In 20 cases injury to the front of the abdomen has caused laceration of the kidneys; in all but two of these this was the sole result of the accident. When a single intraperitoneal organ is injured in association with lacerated kidney, it is always on the same side as the injured kidney. Symptoms which are usually associated with peritonitis occurred in 18 cases, in 8 of which operation demonstrated the absence of any intraperitoneal complication, and in the other 10 the symptoms subsided without operation. The majority of tumors in the loin due to blood appear immediately

¹ N. Y. Med. Jour., Jan. 30, 1904.

² Austral. Med. Gaz., Nov., 1903.

³ Boston M. and S. Jour., July 9, 1903.

or very soon after the accident. The average time of first appearance in those in which the tumor represents hydronephrosis is considerably later than in those in which it is perinephritic abscess. The increase in the size of the tumor does not necessarily imply dangerous hemorrhage, provided it does not take place rapidly or continue too long. Hydronephrosis and perirenal extravasation may continue to be present for a considerable time without infection occurring. In a relatively small number of cases the kidney is lacerated by direct impact of the ribs when the latter are fractured immediately over the organ. The majority of rents found in subparietal renal injuries are in the direction of the transverse axis, and are most marked near the middle of the organ, which is the narrowest and weakest part. The ability of the kidney to maintain a useful degree of functional capacity and also a remarkable power of regeneration of its tissues after severe traumatism has been shown experimentally and clinically. Hematuria is present in at least 80 % of all cases. Absence of hematuria is due to one of the following causes: Tearing across of the renal pelvis, ureter, or bloodvessels; disintegration of the kidney or obstruction of the outlet of the renal pelvis. The average duration of hematuria in 167 cases was 8 days. There were 20 cases in which the renal bloodvessels were injured. Infection takes place from the blood-channels, the bladder, or the intestine. The most fatal factor in subparietal laceration of the kidney is hemorrhage, it being responsible for 25 out of 112 deaths in the uncomplicated cases. Laceration of the peritoneum or intraperitoneal organs is the most fatal complication of ruptured kidney, the greatest number of deaths being due to intraperitoneal hemorrhage—66 %. Sixty-one of the entire number of 190 deaths were due to hemorrhage. Anuria caused death in 10 cases in which but one kidney was injured, the other being normal. Anuria of 24 to 48 hours' duration was present in several cases which ended in recovery. Of 487 uncomplicated cases, 273 were treated expectantly, with 81 deaths; 99 were treated by operations other than nephrectomy, with 7 deaths; and 115 were treated by nephrectomy, with 25 deaths. In cases complicated by an intraperitoneal lesion laparotomy will be the only avenue of approach by which all the sources of bleeding can be under command. The kidney should be saved as much as possible. If the bloodvessels, pelvis, and ureter are intact and the injury to the kidney is not too great, tampon or suture the renal wound and drain through a lumbar incision. If one end only of the organ is damaged, do a partial nephrectomy. If the hemorrhage is intrarenal, nephrotomy should be done, tamponing the renal wound and removing the packing after 24 hours or closing it by suture. If the damage to the kidney is too great, nephrectomy should be performed. Hematuria is treated expectantly unless there are constitutional symptoms of hemorrhage. Conditions in connection with hematuria which call for prompt surgical treatment are: The sudden disappearance of blood from the urine if accompanied by pain, and the appearance, or, if already present, an increase in size, of a tumor in the loin; these show that the pelvis or ureter has become blocked by a blood-clot or debris and demands

prompt surgical treatment; retention of urine due to the presence of blood-clots in the bladder; profuse hematuria continuing longer than 36 hours; prolonged hematuria unless the blood be small in quantity, and secondary hematuria; signs of progressive hemorrhage. Surgical intervention is indicated to guard against infection when there is a tumor in the loin which does not begin to subside within a reasonable time—say, 2 weeks. When the bladder becomes infected. When there is reason to suspect the previous existence of such disease of the kidney as tumors, calculus, pyelitis, or pyelonephritis.

V. P. Blair¹ describes his **operation for fixation of the kidney**. By means of the elongated peritoneal covering the kidney is drawn up to the lumbar wound but not eviscerated. Three transverse cuts are made in the fibrous capsule, one inch apart, extending from the hilum to the external border, care being taken not to injure the cortex. The ends of these strips of capsule are cut in such a way as to raise them up alternately, so that there will be 2 from the dorsal border and 1 from the pelvic border. The free ends of these strips are grasped by forceps and passed through the fatty capsule at points that will correspond with their attached ends. The fatty capsule is now stitched over the dorsum of the kidney covering the raw surfaces of the cortex. The protruding strips of the fibrous capsule are now passed through the lumbar fascia and muscles of the back and fastened in the superficial fascia with catgut sutures. Before the fibrous strips are drawn as far into the parietes as desired, the peritoneum around the kidney is caught in convenient places and tacked to the lumbar fascia in such a way as to draw it taut over the anterior surface of the organ, thus restoring another of its natural supports. This operation anchors the kidney but allows it its own respiratory excursion.

David Newman² reports a case of **floating kidney** (distinct mesonephron) in which nephrorrhaphy was performed.

M. L. Harris³ has investigated the **influence of trauma in the production of movable kidney**. He presents the following conclusions: 1. Movable kidneys occur in women with a particular body form, and practically all women with this body form have movable kidney of greater or less degree. This body form consists in a contraction of the midzone of the body and shallow paravertebral niches. 2. Movable kidney is not produced immediately, but requires time for its development. 3. While it is possible to injure, crush, or suddenly displace by violence a normally fixed kidney, such displacement is always accompanied by laceration of the perirenal tissues, which is manifested by distinct local and general symptoms. 4. Severe injuries involving the kidney or perirenal tissues are seldom or never followed by movable kidneys. Sterns says he has not been able to find a single case in the literature where such a result occurred. 5. A movable kidney is never the immediate result of a single trauma.

R. C. Larrabee⁴ examined 272 women for **movable kidney**, finding

¹ Interstate Med. Jour., May 4, 1904.

² Brit. Med. Jour., June 18, 1904.

³ Jour. Am. Med. Assoc., Feb. 13, 1904.

⁴ Boston M. and S. Jour., Nov. 26, 1903.

it in 112, or 41.5 %. In 39 the kidney was merely palpable, being felt only on deep inspiration; in 49 it could be held down during expiration; and in 24 it could be pushed about freely. In 37 children examined the kidney could be felt in 3. Movable kidney was found in 41 % of single women and in 44 % of married women. In 66 % there had been loss of weight before coming under observation. Trauma was given as the probable cause in but one case. All but 9 patients wore corsets or other constricting articles of clothing. In 40 cases there were no symptoms. Six cases gave a history of Dietl's crisis. Nephrorrhaphy is indicated where any of the serious complications, such as hydronephrosis or pyonephrosis or severe crises are present, and where there are disabling symptoms that cannot be relieved by simpler means.

Augustin H. Goelet¹ describes a **method of suturing the prolapsed kidney** which he has practised in 171 consecutive nephropexies on 134 patients. In none of these cases was there a failure to secure sufficient fixation. The cases have been followed up carefully and frequently examined. Goelet lays great stress upon the necessity of thoroughly separating the fatty capsule, and especially that portion of it which lies between the kidney and the colon and duodenum, before introducing these sutures. He does not split the fibrous capsule or detach it from the kidney, as he does not believe this to be necessary. The kidney is fixed by the introduction of 2 silkworm-gut sutures extending only about a half-inch beneath the fibrous capsule. These sutures are introduced a little below the middle of the kidney and are made to pass out through all the structures of the abdominal wall, and are tied over two pads of gauze placed over the wound. Where there has been much fat about the capsule, a gauze pack is placed under the lower pole to separate the colon from the kidney, but this is removed at the end of 48 hours. The patient is kept in bed for 3 weeks and the sutures are not removed until the twentieth day.

Leonard Freeman² reports an interesting case of **unilateral hematuria from chronic nephritis with recovery after decapsulation of the kidney**. The patient was a man, 59 years of age, who had suffered from attacks of hematuria for 20 years. Various kinds of internal medication failed to relieve the condition. Examination of the separate urines showed that the blood came from the left kidney. A provisional diagnosis of unilateral renal hematuria from chronic interstitial nephritis was made. The kidney was exposed, found of normal size, delivered through the wound, and decapsulated. The surface was gray, mottled yellowish gray, and the capsule was adherent. There was hemorrhage from the cortex was considerable and was checked with a ligature. The patient's recovery was complete. The urine became normal within 18 days and remained so. Two months after the operation the urine was perfectly normal. Eight months after the operation the patient was perfectly well. A small piece of the removed capsule was examined microscopically and showed a chronic interstitial nephritis with abundant small soft, hyaline casts in the tubules.

¹ Ann. of Surg., Dec., 1903.

² Ibid., Aug., 1904.

clusions are as follows: "(1) A prominent cause of renal hematuria, which is often unilateral, is chronic interstitial nephritis, often involving the glomeruli; (2) this, together with other obscure causes, must be excluded before a diagnosis of 'essential hematuria' can be made. (3) Decapsulation of the kidney is indicated in these cases, as it offers a good prospect for cure of both the hematuria and the nephritis. Nephrectomy should be discarded on account of probable involvement of the other kidney."

Jaboulay¹ strongly advocates the operations of **capsulotomy and decapsulation in Bright's disease**, reporting a case of far-advanced disease occurring in a woman, 41 years of age, who was apparently completely cured by decapsulation.

A new method of operating for the cure of chronic nephritis is described by Bakes,² who has had such good results from decortication of the kidney for chronic Bright's disease that he has endeavored to improve the operation and has practised this method in one case which promises well. The objection to the usual method is that the kidney, after its capsule has been removed, is placed against tissue that is poorly supplied with bloodvessels—that is, the perinephric fat. He, therefore, suggests two substitutes, the first of which he employed in the case mentioned. It consists in making an opening into the peritoneum and withdrawing a portion of the omentum, which is then wrapped around the kidney and stitched to it. The other suggestion is that the kidney is passed into the peritoneal cavity and allowed to rest between the mesocolon and the mesentery of the small intestine.

J. C. Hubbard³ reports 7 cases of **decapsulation of the kidney**. In no case can it be said that cure resulted, as in not one of them has the urine been free from albumin. One is, however, without subjective symptoms or a urinary sediment 1 year and 4 months after operation, and another 7 months after operation, although lost sight of since. Of the remaining 5, 1 somewhat improved, died 6 months after operation, of tuberculosis, and the remaining 4 died, unimproved—2 in 19 days, and 1 in 3 months after operation.

A. H. Ferguson⁴ believes that all cases of **movable kidney**, whether or not presenting symptoms, should be treated by decapsulation and fixation, because of the danger of nephritis, and that both acute and chronic Bright's disease, without reference to the variety or cause, should be subjected to decapsulation.

George M. Edebohls⁵ says that **decapsulation of the kidneys** for chronic Bright's disease has been performed up to the present time in from 200 to 300 cases. Edebohls has elsewhere reported cases in which he has performed the same operation for acute nephritis, acute pyelonephritis with millary abscesses, hydronephrosis, pyonephrosis, polycystic degeneration of the kidneys, and puerperal eclampsia of renal origin. One invariable effect of renal decapsulation as observed in all

¹ Arch. gén. de Méd., Nov. 17, 1903.

² Zent. f. Chir., 1904, No. 14.

³ Boston M. and S. Jour., Jan. 28, 1904.

⁴ Jour. Am. Med. Assoc., Apr. 16, 1904.

⁵ N. Y. Med. Jour., May 21, 1904.

experiments on animals is the formation of a new capsule replacing the one removed by operation. The new capsule becomes distinctly organized in from 3 weeks to 3 months after operation; it is sometimes thicker, sometimes thinner, but always more succulent than the original, and always vascular. The preponderance of evidence thus far is clearly in favor of the formation of new vascular connections between the kidney and surrounding tissue in the majority of animals of various species after decapsulation of normal or acutely inflamed kidneys. The question of possible danger from contraction of the new capsule may be disregarded. Elebohl's advises decapsulation in every case of chronic Bright's disease which has a reasonable expectation of not less than a month of life without operation, and in which the following 3 conditions are fulfilled: First, the clear and unequivocal establishment of the diagnosis of chronic Bright's disease; second, the absence of absolute contraindications to any operation; third, the possibility of securing the services of a surgeon reasonably familiar, from practical experience, with the surgery of the kidney. Of 47 surviving patients operated on at periods varying between 6 months and 12 years ago, whose present condition is known, 7 suffered from chronic parenchymatous nephritis, 17 from chronic interstitial nephritis, 19 from chronic diffuse nephritis, and 4 from a combination of right chronic interstitial and left chronic diffuse nephritis. Of the 7 patients with chronic parenchymatous nephritis, 3 are cured, 2 are progressing satisfactorily toward cure, and 2 are improved. Of the 17 cases of chronic interstitial nephritis, 11 are cured, 3 are progressing toward cure, 1 is improved only, and 2 are unimproved. Of the 19 cases with chronic diffuse nephritis, 6 are cured, 8 are progressing toward cure, 2 are improved, and 3 are unimproved. Of the 4 cases of combined right chronic interstitial and left chronic diffuse nephritis, 1 is cured, 2 are progressing toward cure, and 1 is unimproved. In some cases pronounced cardiac hypertrophy has entirely disappeared as the result of operation. Out of 72 patients operated upon up to the end of 1903, 9 had albuminuric retinitis at the time of operation, all dying within a year of operation. It has been suggested always to anchor the kidney to the muscles of the back. But this favors the formation of a denser capsule and should be done only when the kidney is movable and the mobility of the kidney itself gives rise to decided symptoms. The necessity of securing healing by first intention is emphasized, as nephritics do not stand suppuration well. Of the 72 cases, there were 11 cases of unilateral nephritis. Renal decapsulation applied early in the course of a chronic nephritis and in the absence of complications is almost free from danger in expert hands and is almost a certain cure.

I. W. Hall and G. Herxheimer,¹ in an experimental investigation into the effects of **decapsulation of the kidney**, in which rabbits were used, found that when the capsule is removed from healthy kidneys, it reforms early, and at the end of from 10 to 20 days is represented by a fibrous covering thicker than the original capsule. Johnson was unable

¹ Brit. Med. Jour., Apr. 9, 1904.

to detect any vascular anastomoses between the cortical and perirenal vessels in dogs; Emerson observed vascular connections with adjacent organs but not with the fatty tissue. In rabbits Claude and Balthazard and Jaboulay state that a slightly increased vascularity may occur. After decapsulation of the kidney in some 35 rabbits the writers have not observed any marked formation of new blood-channels between the kidney and adherent tissues. In a number of rabbits nephritis was induced by the injection of neutral ammonium chromate and decapsulation performed 3 days later. After 24 hours there was little trace of the capsule, and small clots of blood were visible on the surface of the kidney. At the end of four days the kidney was covered by a thin, whitish film, whose density varied in different areas. In some instances the kidneys were adherent to the liver or adjacent tissues. The blood-clots disappeared, and the filmy covering increased in opacity and in density until, at the end of 10 days, it was as thick as the normal capsule of the other nondecapsulated kidney or of those of the control animals. To the end of the experiments the capsule continued to increase in thickness and to become closely adherent to the neighboring structures. The writers conclude that there is no anatomic basis for the good results which must be explained by some other theory, such as the relief of tension, action upon the sympathetic ganglions, in which case simple incision or puncture would give as good results without the disadvantages of decapsulation. In acute nephritis, anuria, hematuria, puncture, and decapsulation of the kidney is said to yield relief, the results probably being due to relief of tension. Since the completion of these experiments Bonez-Osmolowsky has published a paper describing the effects of decapsulation on the kidneys of rabbits. He found that, 6 days after decapsulation, the leukocytes and connective tissue were increased between the tubules and that the cells of the superficial tubules showed granular changes in the protoplasm. Twelve days after the operation the superficial tubules and glomeruli were slightly compressed by the connective-tissue elements and there was atrophy of the renal cells. He did not observe any new formation of bloodvessels in the reformed capsules.

A. A. Berg,¹ in a paper on **the surgical treatment of nephritis**, says, establish, first of all, the causation of the nephritis and so ascertain whether or not the case is at all fit for operation. Secondly, put the patient for a reasonable time upon internal treatment with restricted dietary and good hygiene. If improvement is noticed, continue with this treatment, but as soon as the patient reaches the stationary stage or gets worse, then resort to operative treatment without delay. Nephritis due to malposition, either congenital or acquired, to irritation of a foreign body as a stone, to toxins of bacterial life, *e. g.*, scarlatinal nephritis, nephritis of measles, rheumatism, etc., and those due to bacterial action exclusive of the tubercle bacillus, *e. g.*, colon group, staphylococcus, streptococcus, etc., are benefited by operation. Those due to general metabolic disturbances resulting in sclerosis of the internal organs and bloodvessels, those due to newgrowths, those due to disturbances in the

¹ Med. Rec., June 18, 1904.

general circulatory system, and those due to chronic suppuration and chronic exhaustive diseases are not benefited by operation.

C. S. Jewett¹ reports 2 cases of **decapsulation of the kidney for nephritis**, discusses the whole subject, and reaches the following conclusions: 1. In certain cases of acute nephritis operation may be of use in relieving suppression of urine, pain, or hematuria; it may perhaps hasten recovery and aid in the prevention of chronic nephritis. 2. In hopeless cases of chronic nephritis decapsulation will sometimes relieve distressing symptoms and prolong life. 3. Should the results claimed by Elebohlis be duplicated in the practice of various operators, and should the supposed reparative results of his operation be confirmed by future autopsies, then the possibility of operative cure of certain cases of chronic nephritis must be admitted.

J. Tyson and C. H. Frazier² report a case of **scarlatinal nephritis treated by decapsulation** in which marked improvement occurred.

Edward Reynolds³ reports 4 cases of **decapsulation for nephritis, with improvement in each**. He presents the following conclusions: 1. We must admit that our present knowledge of the pathologic physiology of renal disease is still defective, but we are justified in believing that nephritis has, as a rule, an infective origin, and probably that the defective renal drainage, due to swelling of the organ within a rigid capsule, plays a part in maintaining the disease. 2. The cases in which general uremic symptoms are more prominent than the physical signs obtained on the examination of the urine are unpromising cases for operation. 3. When the urinary signs and constitutional depression outweigh the distinctly uremic general symptoms, we may regard the cases as favorable for operation. 4. When one kidney is mainly or predominately affected, a unilateral operation upon that kidney offers an excellent chance of prolonged improvement in health, if not, indeed, of ultimate cure. 5. In women, in whom ureteral catheterization involves little trauma and less risk, all cases of chronic nephritis should be subjected to ureteral catheterization and the unilateral ones selected for operation.

Ramon Guiteras⁴ has sent out a circular letter to the leading surgeons of this country concerning the question of the **operative treatment of chronic nephritis**, and states that the surgeons are about equally divided in favor of and against the operation. He has also collected 120 cases of decapsulation for chronic nephritis with 16 % cured, 40 % improved, 11 % unimproved, and 33 % died. The mortality in chronic interstitial nephritis was 26 %; in chronic parenchymatous, 25 %; in chronic diffuse, 75 %. He concludes that—1. Chronic nephritis should not be operated upon until medical treatment has proved of no avail. 2. The time for operation is when it is noticed that the process is advancing rapidly and we fear that the heart will soon become overtaxed. 3. The operation for chronic Bright's which has proved least dangerous and which has shown the best result is nephropexy performed on a single movable kidney. 4. The most unfavorable cases for operation are

¹ Buffalo Med. Jour., Aug., 1903.

² Univ. of Penna. Med. Bull., Sept., 1903.

³ Boston M. and S. Jour., Feb. 4, 1904.

⁴ N. Y. Med. Jour., Nov. 7, 1903.

those of diffuse nephritis. 5. Cases of general anasarca with bad heart action should not be operated upon; if the heart-action is good, an operation performed as a *dernier ressort* may give the patients a few extra months of life, provided they survive it. 6. Where there has been a marked destructive process in the kidneys as a result of a nephritis, the operation may relieve them for a number of weeks or months, but they generally fail again and die when the new capsule begins to contract.

J. B. Blake¹ reports 5 cases of **renal decapsulation for chronic nephritis**. Two of the 5 are, for the practical purposes of business and occupation, well. Two have died at intervals of 4 days and 6 months after the operation. One is not relieved. The operation was always followed by a temporary diminution in the amount of urine, but this quickly disappeared, and within a few days the amount usually exceeded that passed before operation. An increase of blood in the urine was always demonstrable by the microscope.

J. H. Ferguson² reports 17 cases of **decapsulation**, with good results in all. In the vast majority of the cases the kidneys were movable and also chronically inflamed. In only 2 cases was the operation done for parenchymatous nephritis. He believes that the operation is practical and effectual in acute, subacute, and chronic nephritis, both interstitial and parenchymatous.

A. T. Cabot³ has treated certain cases of **interstitial nephritis and pyelonephritis** by continuous catheterization of the bladder. These cases were mostly old men suffering from obstructive disease of the prostate. The ureters and pelves of the kidney empty themselves and afterward remain empty. He believes that the relief of pressure extends even through the uriniferous tubules into the malpighian bodies, and diminishes the tension around the vascular glomeruli. He concludes that: 1. The relief of tension in kidneys that, owing to long obstruction, are exhibiting the clinical phenomena of interstitial nephritis usually brings about a return of normal function. From this it would appear that the renal condition is directly due to the obstruction and increased tension. 2. It seems probable that in cases of dilated ureters, permitting regurgitation of urine from the bladder back into the pelves of the kidneys, a long drainage of the bladder will permit such a shrinkage of the ureters and ureteral orifices as to restore the normal valvular action of the ureters, and the retroflow of the urine will thus be stopped.

The New York Medical Journal⁴ states that if some simple procedure can be substituted for the operation of ureteral catheterism for diagnostic purposes, a considerable advance will have been made. Catheterism of the ureter requires special skill, and the passage of a catheter into a healthy ureter after it has traversed an infected bladder involves great danger of carrying the infection deeper. Giordano⁵ conceived the idea of mediate **renal expression for diagnostic purposes**, and carried it out by massage of the kidney. He found that the feasibility of this sort

¹ Boston M. and S. Jour., Aug. 13, 1903.

² Jour. Am. Med. Assoc., July 4, 1904.

³ Boston M. and S. Jour., Nov. 19, 1903.

⁴ Apr. 3, 1904.

⁵ La Sem. mèd., Mar. 30, 1904.

of expression was proved by the presence of blood in the urine after massage of the kidney containing angular calculi. In the diagnostic procedure, after the patient has rested in bed for a few hours, the bladder is emptied, and then one of the kidneys, together with its ureter, is subjected to combined massage of the lumbar and lateral abdominal aspects. The urine that enters the bladder in consequence of this maneuver is withdrawn, the bladder is washed out, and the procedure is applied to the other kidney. Nicolich's method differs from Giordano's method in that he leaves a catheter in the bladder during the massage, and the urine that trickles from it shows the differences between the products of the two kidneys. In 2 instances a diagnosis arrived at on the strength of this device was confirmed by nephrectomy.

G. Kolischer and L. E. Schmidt,¹ in a paper on **ureteral catheterization**, state that air-dilation of the bladder necessitates either an uncomfortable position for the patient or the maintenance of the dilation by constant pumping, which leads to irritation of the bladder-wall. In the latter form of air-dilation it is necessary to remove the cystoscopic window frequently and to dry the bladder by swabbing, which is productive of traumatism and pain. These instruments are of large caliber and usually call for the use of cocain, which adds to the danger. The field of view is also small on account of the absence of a lens system. The most satisfactory results are gained by dilating the bladder with sterile water or other transparent fluid. Casper uses 1:5000 solution of oxycyanate of mercury. The best lubricant is pure glycerin, which readily dissolves in water so that the lamp and window are rapidly cleared after insertion. In the case of an infected bladder the viscus is flushed with a silver solution and this is repeated at the completion of the examination. Before withdrawing the ureteral catheters a few drops of a 1:1000 protargol or 1:500 argyrol solution are instilled into the ureters. The bladder is filled as full as possible with sterile water without causing the patient pronounced discomfort. The patient is placed in a sitting position, with the pelvis slightly raised. If the catheters are left in the ureters, the patient is placed in a recumbent posture. In the majority of cases local anesthesia is unnecessary. In very sensitive patients a morphin suppository may be inserted into the rectum 10 minutes previous to the examination. In some cases the discovery of the urinary whirl is facilitated by the administration of indigo-carmin. In certain cases the procedure is made easier by elevating the trigon through the vagina or rectum. The location of the ureteral orifices varies normally. The best cystoscope is that of Brenner, to which is adjusted a Casper slide bar, the whole giving a caliber of No. 20.23 F. After the first catheter is inserted into the ureter, the slide-bar is withdrawn and the cystoscope is turned to one side; the catheter slips out of the open groove, and the canal is reconstructed by reintroducing the slide-bar. The second catheter is now introduced. This instrument gives a direct view, is of convenient size, and allows catheterization of both ureters at the same sitting.

¹ Jour. Am. Med. Assoc., June 4, 1904.

R. A. Bickersteth¹ describes **Luys's urinary separator**. The method of Luys consists in placing in the bladder a vertical septum which divides it into 2 equal halves. Luys's separator looks like an ordinary urethral bougie with a rather peculiar curve at its vesical end; at the opposite extremity it is fitted with a handle and screw suggestive of a lithotrite. The shank of the instrument, including the curved portion, is made up of 3 parts: in the middle there is a thin metallic support, flattened from side to side, and on each side of this, and closely applied against it, is a metal catheter tube, semicircular in section. The two catheter tubes are provided with eyes on the concave border of their curved portion; they can be quickly detached from, and reapplied to, the sides of the median support, and when they are in place, they make up, with the support, a single instrument which is circular in section and corresponds in size to a No. 21 bougie, French scale (between 12 and 13 English). Along the upper edge of the median support runs a little rod which is arranged to move backward or forward at will, as the screw at the end of the handle is turned one way or the other; at the junction of the straight with the curved part of the instrument this rod ends in a little chain, the other end of which is attached close to the instrument's point. When not in actual use, the chain is slack and lies closely along the hollow of the curve, but it will be seen that by turning the screw the chain can be tightened up until it forms a straight and rigid cord across the curve. To prepare the instrument for use the two catheter tubes are detached and then, over the median support with the chain slack, a thin tube of pure rubber specially prepared for the purpose is drawn. The catheters are replaced and all is ready for work. It will be noted if the chain is now tightened up that as this rises it gradually stretches and draws out the rubber until, when the chain is tight, there is a complete septum of rubber filling up the whole curve of the instrument. The curves of the instrument apply themselves against the floor and neck of the bladder when the separator is in use. The floor of the bladder is depressed by the separator and the natural elasticity of the parts is quite sufficient to cause them to fit closely against the convexity of the curve, only very slight pressure being required to make a perfectly water-tight division.

W. E. Lower² makes the following deductions on the value of **ureteral catheterization and urine separation with cryoscopy** in surgical diseases of the kidneys: 1. Before doing a cutting operation upon a kidney—especially before doing a nephrectomy—the presence of a second functionating kidney should be established. 2. The best and safest method for ascertaining the presence of a kidney is by the aid of cystoscopy and ureteral catheterization. 3. The function of the kidney is best determined in order of importance: (a) By the freezing-point of the urine; (b) by phloridzin glycosuria; (c) by the quantity of urine excreted; (d) by the freezing of the blood. 4. The most reliable method of obtaining the separate urines is by the ureteral catheter.

T. C. Witherspoon³ reports a case in which he performed the following

¹ Lancet, Mar. 26, 1904.

² Med. News, Dec. 19, 1903.

³ N. Y. Med. Jour., May 21, 1904.

operation to reach the lower ureter by an extraperineal route. Through a longitudinal incision in the lower part of the rectus the peritoneal cavity was opened and the ureter explored. The peritoneal opening was next sutured, the bladder pushed upward and inward, and the peritoneum separated from the side of the abdominal wall as far as the iliopectinal line. The index-finger was pushed into the pelvis at the side of the bladder, pushing up the false ligament of the bladder until the vas deferens was reached. The ureter was found just behind the vas deferens and was exposed for 3 or 4 inches. The advantages of this route may be stated as follows: 1. It is extraperitoneal and avoids the danger of peritoneal infection. 2. The opening is directly over the route of the ureter and allows a good view of that structure through a very small cut in the abdominal wall. 3. It allows of a thorough palpation, through the peritoneum, of both kidneys and ureters, and at the same time of an exposure of the ureter on the side of the incision for extraperitoneal operation upon its lower end. Many times a decided doubt exists as to the full extent of the trouble, and in these cases a thorough palpation of the entire urinary tract may be of value. 4. The field of operation is bloodless and no forceps are in the way. 5. Drainage is usually necessary after opening the ureter, which may be carried through the lower end of the rectus and does not leave the bright prospect of hernia which a para-Poupart incision does. 6. The dissection is not difficult and can be carried out by any reasonably prepared surgeon, as it does not require the skill of a specialist.

T. Ticken,¹ in a paper on cryosecopy, gives Raoult's laws: "All soluble substances dissolved in a liquid lower the freezing-point of that liquid, and the degree to which the freezing-point is lowered is proportional to the amount of the substance dissolved. When a mixture of different substances is dissolved in a liquid, the freezing-point of the liquid is lowered to a degree equal to the sum-total of the freezing-points of each substance contained therein. Fixed amounts of a substance dissolved in a definite amount of fluid always lower the freezing-point of the solution to a definite degree." The **freezing-point of normal urine** varies from -0.55°C . to -2.3°C . The freezing-point of blood varies from -0.55°C . to -0.57°C ., being fairly constant at -0.56°C . Kümmel, after making 500 examinations, considers the method of the greatest value. He attributes the differences in the results obtained by many recent writers to errors in technic. He does not rely upon cryoscopic examination alone in any case, but uses it in connection with the usual methods as a supplementary test. Ticken uses the Beckman apparatus, substituting the Heidenhain thermometer on account of its simplicity. This thermometer is standardized and graduated in $\frac{1}{100}^{\circ}\text{C}$., the scale ranging from $+0.5$ to -5.5°C ., and is the all-important part of the apparatus, which consists of a glass jar, 5×7 inches; an iron stirrer for the salt, water, and ice mixture; an inner tube for the fluid, fitted into a larger air-tube, which in turn is placed directly into the freezing mixture; a stirrer with a platinum loop for the inner tube and a

¹ Chicago Med. Recorder, Apr. 15, 1904.

thermometer for the freezing mixture, to control the temperature of this solution. The salt, water, and ice mixture fills the jar nearly to the top; the air-tube, thermometer for the bath, and inside tube are now adjusted, and the previously cooled liquid poured into the side arm of the inner tube, in sufficient amount to cover the mercury bulb of the large thermometer entirely. This usually requires about 10 to 15 cc. of liquid. In my apparatus 10 cc. is sufficient to cover the bulb. The salt-ice mixture is now stirred until the bath thermometer registers not more than -3° C. The fluid to be frozen must be constantly stirred from beginning to end, to insure accuracy. The mercury falls below the permanent freezing-point at first, and then, as freezing occurs, rises rapidly until the true freezing-point is reached, where it remains constant, for a short time only, and then falls again to the temperature of the surrounding fluid. After reading the results the entire inner tube, thermometer, and stirrer must be thoroughly cleaned and wiped perfectly dry before using again. The entire process requires about 15 minutes, after a little practice. Since everything depends upon technic, one must practise with distilled water and a 1% salt-solution until absolutely constant results are obtained. Certain precautions must be observed, and most important of these are: (1) The testing of the thermometer before every estimation. (2) Do not cool the liquid too much: never below -3° C. (3) Stir constantly from beginning to end. (4) Do not allow bulb of thermometer to touch the bottom of the inner tube, nor allow it to be only partially immersed. (5) Do not take your reading too soon; neither dare you wait too long—about 30 seconds is sufficient. (6) Employ the same amount of fluid in every case. The freezing-point of urine is influenced by so many factors that it loses much of its value in diagnosis. Normally there is a difference in the functional activity of the 2 kidneys. Cryoscopic examination for urine does not offer any great advantage over the well-established chemic and microscopic methods. The blood gives more valuable information. The amount of blood required is about 10 cc., and is readily obtained by puncturing one of the larger veins of the forearm with a Luer syringe. Although normally the freezing-point of the blood is nearly constant, there are certain conditions other than kidney lesions which influence it more or less. Severe anemias, edema, ascites, hydrothorax, and cachexia have a tendency to elevate the freezing-point, while abdominal tumors, cyanosis, icterus, diabetes mellitus, and diseases disturbing the hepatic function have a tendency to lower it. It is unsafe to remove one kidney when the freezing-point of the blood is lower than -0.59° C.

B. G. A. Moynihan¹ reports 2 cases of **hydronephrosis due to abnormalities in the ureters**. The first was a case of stricture of the ureter in which ureteroplasty was performed, the stricture being incised longitudinally and sewed transversely. This was followed by a recurrence, and the ureter below the stricture was anastomosed with the pelvis of the kidney; recovery followed. The second presented a valve-formation at the upper end of the ureter and was treated much in the same way, with a similar result.

¹ Brit. Med. Jour., Apr. 30, 1904.

An interesting case of **papilloma of the renal pelvis with massive hydronephrosis** is presented by H. B. Reynolds.¹ Before operating upon the case an exploring needle was introduced through the left flank and a quantity of fluid removed which showed traces of urea and contained albumin and paralbumin. The case was interesting from a diagnostic point of view, the following conditions being considered: pancreatic cyst, mesenteric cyst, suprarenal tumor, and perinephric cyst. The position of the mass, dulness in the flanks, and the position of the colon indicated a retroperitoneal cyst, and the urinary findings pointed strongly to the kidney. The size of the mass, the presence of blood in the urine, periodic polyuria, and the presence of urea in the fluid removed pointed strongly to a hydronephrosis. When the cyst was exposed, it was punctured and 14 pints of dark syrupy fluid were removed. The cyst was then removed, the pedicle being ligated *en masse*; the ureter was ligated separately and cauterized. The peritoneal cavity was accidentally opened, but closed. The patient died from hypostatic congestion of the lungs on the fifth day. This condition was not infectious, but purely hypostatic, and due to the weakened circulation, the direct result of a severe operation in a patient nearly 70 years of age and of low vitality. The hemoglobin was but 42 (%). The autopsy showed the other kidney normal and the wound and peritoneal cavity in good condition. The cyst was a large hydronephrotic sac with no tissue showing kidney-structure. The tumor found was a papilloma the size of a small tomato, situated just above the ureteric orifice and blocking its entrance by tumor-masses. The microscope verified the diagnosis. Tumors of this nature are extremely rare. Albarran and Imbert were able, in 1903, to collect but 22 cases.

A case of **traumatic pyeloparanephric cyst** is reported by Gallaudet² (New York). The patient was a boy, 15 years of age, who in his twelfth year was struck in the abdomen by the handle of a shovel. From this time until the time of his admission he was in good health except for more or less continuous pain in the right side of the abdomen. Two weeks before admission he had a fall and struck his abdomen with considerable force on the roof of a shed. He was confined to bed for several days with nausea and vomiting, and during the first 48 hours passed blood by the urethra. After getting up the abdominal pain persisted. From a study of the developments in this case it is evident: (1) That the first traumatism ruptured the pelvis of the kidney and also caused hematoma both within the pelvic cavity and in the paranephric tissue; (2) that, as time went on, the blood was gradually absorbed, and the thickened capsule (extrapelvic portion) of connective tissue was formed (as just described) from the paranephric tissue; (3) that the opening into the pelvis, however, remained, but the capsule (extrapelvic portion) was strong enough to hold any urine that might come through and prevent its extravasation; and (4) that the second traumatism caused a fresh hematoma, partly by tearing the inner surface of the capsule and partly by causing small lacerations of the kidney. Hence, in making the

¹ Ann. of Surg., May, 1904.

² Med. News, Mar. 5, 1904.

individual comparisons it is shown—(1) That the cyst, or rather cyst-wall, having two parts, the one (pelvic) portion corresponds to that of cysts occurring in "preëxisting spaces other than alveoli of glands," and the other (extrapelvic portion) corresponds to that of "cysts of new formation"; (2) that, as regards the cysts as a whole, both portions make a common capsule inclosing a common cavity; and (3) that traumatism was the predisposing cause. A nephrectomy was done in this case, and the patient made a satisfactory recovery.

L. E. Schmidt¹ publishes some **newer methods in use in the diagnosis of ureteral and renal diseases**. By cystoscopy the condition of the bladder mucosa and the number, formation, and position of the ureteral openings may be observed. Gaping of the ureteral opening accompanies kidney disturbances. The ureteral mucous membrane protrudes in ureteritis. Watching the contractions of the ureteral ends and the intervals between the urinary whirls gives some information as to the activity of the kidneys. After the injection of methylene-blue the urine becomes green in from 15 to 30 minutes; the greater the amount of parenchyma destroyed, the longer the time elapsing before tinged urine appears. The injection of 16 cgms. of indigo-carmin into the gluteal muscles causes discoloration of the urine in from 15 to 30 minutes in normal cases. Potassium iodid may be given internally, and the bladder filled with a solution of hydrogen peroxid containing starch. As soon as the potassium iodid begins to be excreted, the urinary whirl will be of a bluish color. Segregation is reliable only if a previously performed cystoscopy has assured the normal condition of the bladder. The phloridzin test consists in the injection, hypodermatically, of 0.005 phloridzin, and in 10 to 15 minutes, if the kidney is secreting normally, sugar in the urine can be demonstrated. The older methods of examination of the urine should not be forgotten. Efforts have been made to test the efficiency of the kidneys by estimating the electric conductivity of the urine. The value of this method is not known. Concerning the x-ray, a negative diagnosis of calculus does not prove the patient to have no stone, but a positive skiagraph is certain. In some cases a wax-tipped bougie may be inserted into the ureter for the detection of stone.

D. Newman² says that in acute kidney disease the pain is not always referred to the seat of the disease, but may cause spasm of the bladder, pain in the testicle, at the point of the penis, in the hip-joint, down the thighs, or the suffering may be limited to the kidney on the opposite side to the one that is the seat of the disease. Three cases illustrating **renorenal reflex pain** are reported. Case 1: Pain simulating renal colic on the left side, of 5 years' duration; other symptoms and signs pointing to calculus of the right kidney; stone removed from the right kidney; recovery. Case 2: Symptoms of renal calculus on the right side, of 18 months' duration; x-rays detected stones in the left kidney, which were removed; disappearance of the pain on right side. Case 3: Pyonephrosis limited to the right kidney; pus and albumin in the urine; pain most marked in the left lumbar region; nephrotomy; cure. E.

¹ Chicago Med. Recorder, Apr. 15, 1904.

² Lancet, Apr. 23, 1904.

Garceau¹ reports a case in which a **calculus in the ureter was removed by a new method**. The patient was a married woman, aged 34, and the stone was located in the left ureter, 9 cm. from its entrance into the bladder. The anterior culdesac was incised, the peritoneum between the bladder and uterus pushed back, the broad ligament everted, and the stone caught and pulled down into the vaginal outlet, where it was cut down upon and squeezed out. The vaginal incision was sutured with silver wire, which took in the walls of the ureter. The patient recovered without fistula.

L. E. Schmidt² reports a case in which the **ureteral injection of oil was followed by the spontaneous passing of a stone**.

B. Tenney³ publishes a study of 134 cases of **calculus in the ureter**. A stone in the ureter is apt to lodge at one of 3 places—about 7 cm. down, at the brim of the pelvis, or where the ureter enters the bladder-wall. The following conclusions are presented: Of these 134 cases of calculus in the ureter, 12 were relieved by proceedings which did not involve a cutting operation. The calculus was discharged through the urethra naturally, was extracted with forceps, or was broken up with a lithotrite, after being pushed out of the orifice of the ureter. Of the 122 cases upon which a cutting operation was performed, 98 recovered and 23 died—in one the result is not given. Intermittent pain on one side, with varying amounts of red blood in the urine, are constant symptoms of stone in the ureter. Though the best means of locating stones, the röntgen-ray cannot yet give evidence *sufficient in itself* to warrant operating or refusing to operate on certain cases. If a calculus starts from kidney to bladder, it is likely to catch within an inch of one of three places, all of which are accessible to the surgeon through extraperitoneal openings. A single calculus is the rule, but the exception occurs, according to these cases, about once in 8 times. The opening in the ureter or kidney pelvis for removal of the calculus should be sutured if possible. Both sorts of suture materials have been used, with equally good results, and wounds in both locations apparently heal equally well. The recovery is delayed only if sutures are not used. A calculus in the ureter is a menace not only to health, but to life, and its removal is an operation of low mortality, provided it is undertaken before secondary changes appear in the kidneys.

A discussion of **calculus anuria**, relating particularly to its **diagnosis and treatment**, with a report of 2 instructive cases, is reported by A. T. Cabot.⁴ Calculus disease of the kidneys may produce anuria in two ways: First, from the gradual disorganization and destruction of the kidneys in consequence of a pyelitis and pyelonephritis caused by the irritation of the stones. This is the end-result of the disease, and is usually accompanied, if not preceded, by recognizable symptoms of uremia. The other form of anuria is brought about by the stoppage of the ureter by stone. In the first form the diminution in the amount of urine comes on gradually, whereas in the second its onset is sudden and

¹ Boston M. and S. Jour., Apr. 21, 1904.

² Jour. Am. Med. Assoc., Mar. 12, 1904.

³ Boston M. and S. Jour., Feb. 4, 1904.

⁴ Ann. of Surg., Oct., 1903.

often complete. The term calculous anuria is more particularly applicable to the latter form. It is distinguished from other forms of anuria by the sudden onset and by the absence of uremic symptoms. The uremic symptoms, however, develop within from 3 to 10 days, although occasionally death supervenes without their development. Occasionally the anuria may be intermittent, caused by the partial dislodgment of the stone or its falling back into the pelvis of the kidney. Intermittent anuria is not infrequently associated with hydronephrosis. Cabot shows that in nearly every case of complete calculous anuria one kidney has either been destroyed by disease or is congenitally absent. The condition is so distinctly a mechanic one that surgical interference is indicated for its relief, except in those rare cases in which nature removes the obstruction. Morris does not mention a case of recovery from calculous anuria which was brought about by the spontaneous escape of the stone into the bladder; other authors, however, do mention such cases. The reason that the spontaneous escape of the stone downward in these cases is so rare is because the anuria is so complete. The excretion behind the plugged ureter ceases, and there is no longer any pressure from behind to push the stone along. A natural termination of calculous anuria is so rare that Cabot advises surgical interference as soon as it is plain that a cessation of renal function has become established. The mortality accompanying the expectant treatment in these cases is estimated at from 72 % to 80 %. The reported cases of surgical interference are as yet so few that it is difficult to estimate the mortality, but it is far better than that just indicated. Since in practically all the cases one of the kidneys is already functionally inactive, it is obvious that the surgeon must determine in which kidney the calculus is lodged. A careful consideration of the history and an examination of the patient will usually clear up this point. If the pain at the onset of the attack was distinctly localized in one side, especially if that kidney is enlarged and tender, it is reasonably clear that it is on that side that the calculus is lodged. Not infrequently, however, the suppression is so complete from the start that tension in the affected kidney is but slight and of short duration. As a consequence, the pain is moderate in degree and quickly subsides. In the absence of pain and tenderness over the kidney the ureter should be explored by palpation over the abdomen and loin and by rectal or vaginal touch. The röntgen-rays and the cystoscope are also of value in these cases. Catheterization of the ureters in the hands of an expert may lead to the correct understanding of a doubtful case which has baffled other methods of investigation. Before dealing with the treatment Cabot relates his 2 cases, the first of which has already been published. This patient was a man, 60 years of age. The diagnosis was difficult, as Cabot did not see the patient until 6 days after the onset of the anuria, at which time the patient was perfectly comfortable and showed no uremic symptoms. There was no tenderness anywhere in the abdominal or lumbar regions. The following day, in spite of treatment, he had passed no urine, was a little more dull, but had no pain, and there was a little more resistance

in the right renal region than in the left. In the absence of any localizing symptoms an abdominal section was determined upon in order to allow free examination of both kidneys. This was done 7 or 8 days after the establishment of complete anuria. The abdomen was opened in the median line. The right kidney was found to be enlarged—perhaps 3 times its normal size; its surface was irregular and divided into large lobes. Examination of the ureter was difficult, but no hardness suggesting stone could be felt anywhere in the pelvis or in the ureter. The left kidney was of normal size and its pelvis was not distended with fluid. The ureter was carefully followed down to the bladder, but nothing like a stone could be felt. Before operation it was thought that the right kidney had been previously disabled, and that the stone which caused the final suppression was blocking the left kidney. With the object of more carefully examining the left kidney it was exposed through the left loin and was examined bimanually, one hand in the abdomen and the other in the lumbar wound, but the result was negative. It was thought that probably during the manipulation the obstructing stone may have been dislodged. The wounds were closed and the patient made a good recovery from the ether. Three hours later there was a slight escape of urine through the urethra, and on passing the catheter, 37 ounces of light-colored urine were withdrawn. Two gallons of urine were obtained in the first 24 hours. Convalescence was satisfactory, and 2 weeks later, with a litholapaxy pump, a few grains of calcareous matter were obtained, thus completing the evidence that the ureter had been stopped by a calculus which had been dislodged by manipulation. Some time after the patient had left the hospital he had another attack of discomfort in the left side of the abdomen, accompanied by chills and a high temperature. An examination revealed nothing abnormal. Massage through the abdominal wall was given along the course of the ureter and as deeply into the pelvis as possible. When this was completed, the patient was comparatively comfortable. A week or two later a stone of considerable size was passed through the urethra. The second case was that of a man, 57 years of age, who, for years, had suffered from attacks of severe pain starting in the right lumbar region and shooting down into the right groin and into the penis. The attacks occurred about once a year, and were accompanied by nausea, vomiting, and bloody urine, and were usually followed by the passage of small stones. Two years before admission he had an unusually severe attack of pain on the left side, which rendered him much sicker than ever before, and he was laid up for several weeks. This was followed by another attack a few months later. During the year previous to admission the patient had had attacks in the right side about once a week, and for the last 3 weeks had persistent, almost constant, pain in the right side, with nausea and vomiting each day, but passed no stones. The urine gradually diminished until he had passed but 2 or 3 ounces a day. A skiagraph of the renal and vesical regions was negative. It was thought that the right kidney contained a calculus, and that the left kidney was practically useless. The two severe attacks of the left kidney were believed to

account for its inactivity. The right kidney and ureter were therefore exposed. The fatty capsule was tense and edematous, the fat being stiff, almost as if frozen, and closely adherent to the kidney. The kidney was enlarged to nearly double its normal size. An incision along the convexity opened the pelvis, which was explored with the finger, but no stone was found. The ureter was followed down toward the bladder, but nothing could be felt in it. It was carefully stripped from above downward in order to dislodge any stone that might have escaped observation. A drainage-tube was then introduced into the renal pelvis, the capsule was split along the convexity, and the wound was closed as far as drainage would allow. Within the next 6 hours the patient passed voluntarily 900 cc. of urine. In the next 24 hours he passed 1500 cc. and as much more was estimated to have escaped through the tube into the dressings. On the fourth day after operation the urine suddenly ceased coming through the bladder, and a proportionately increased amount escaped through the tube into the dressings. This condition persisted for 48 hours, when the patient, by a forcible effort at urination, succeeded in squeezing out a few drams of greenish pus. A few hours later urination by the bladder was resumed and drainage through the tube again diminished. On the twelfth day two short attacks of pain in the left lumbar region occurred, and on the fourteenth day two stones, about the size of a grain of wheat, were removed by the Bigelow evacuator, and another larger one crushed and removed under cocaine anesthesia on the twenty-fourth day. From this time the recovery was uneventful. After convalescence was fully established the bladder was examined with the cystoscope and the left ureter was found occupied by a string of thick pus which completely blocked it. The following day the same condition was found to exist. Pressure upon the left kidney caused a gush of thick pus from the ureter. These two observations, together with the fact that when, on the fourth day after operation, the right kidney ceased to send its urine to the bladder, that viscus remained empty for two days, seemed to prove beyond question that the left kidney was practically destroyed. As it was wholly insensitive and gave him no trouble, the patient did not care to consider its removal. These cases are particularly interesting, as in both no stone was found and yet the function of the kidney restored by manipulation of the kidney and ureter. In discussing the operative treatment Cabot states that if the case is seen early, within 2 or 3 days after the onset, it is well to remember that the stone may be assisted along the ureter by manipulation. This possibility, however, should never lead to delay in operation, but during the first few days of the anuria, when the case is being studied, efforts to thus dislodge the stone may be made. A stone between the kidney and a point 2 or 3 inches above the bladder may be reached and dealt with through the incision of Israel, running from the twelfth rib downward and forward, just in front of the anterior superior spine of the ilium. In women the lower portion of the ureter may be exposed through the vagina without opening the peritoneal cavity, as Cabot has shown by careful dissections. If we can determine with reasonable assurance

on which side the useful kidney is, it is plainly best to cut down on it, open and explore the pelvis, and, if the stone is not there, to follow down the ureter. If still on stone can be found, the ureter should be thoroughly stripped from above down, to endeavor to dislodge the stones which, from the very fact that they cannot be felt, may be presumed to be small. In such cases as the first reported, in which the symptoms and physical signs fail to give reliable information and the surgeon is in doubt as to which side should be attacked, exploratory laparotomy will furnish the information needed for guidance.

DISEASES OF THE PENIS, URETHRA, TESTICLE, ETC.

N. Karsnowski¹ reports a case of **necrosis of the glans penis following paraphimosis**. The patient was a man, aged 37, who had a paraphimosis for 5 weeks. The penis was swollen and the glans necrotic. The prepuce and the constricting ring were ulcerated and the serotum was the size of a child's head, and in places black. There were extreme fetor and a septic temperature. The necrotic portions were removed and the parts disinfected. Recovery followed.

Villemin² reports 18 cases of **hypospadias** treated by the Beck method, with 18 primary successes. In 1 case, a child 15 months old, the sutures did not hold; as the result of this case Villemin advises that the operation be postponed until after the fourth year. It is not necessary to introduce a permanent catheter at the time of operation, and later sounds are not necessary, as there is no cicatricial tissue.

Lord³ advises that a **meatotomy** be finished by suturing the mucous membrane of the urethra to the surface of the glans. This method possesses the following advantages: Much time is saved when the meatotomy is performed as a preliminary to the employment of the urethroscope, cystoscope, or segregator. The wound usually heals by first intention, and the tedious process of granulation is thus avoided. No after-treatment is needed, the patient being saved much discomfort and pain and the surgeon unnecessary responsibility.

A. Martina⁴ reports 4 cases of **hypospadias** treated by the Beck method. The ages of the patients were 7, 14, 20, and 22 years. A good result followed in each case.

Subkowski⁵ reports a case of **fracture of the penis during coitus**. The patient, a farmer aged 38 years, struck the symphysis pubis with violence, rupturing the left corpus cavernosum. In the left corpus cavernosum could be felt a painful swelling the size of a pigeon's egg. Urination was not interfered with. By the application of cold and compression the swelling subsided by the fourteenth day. The patient made a perfect recovery, neither the urinary nor the sexual function being interfered with.

Bauer⁶ reports a case of **anthrax of the penis and scrotum** occurring

¹ *Wratschelbn. Gaz.*, 1903, No. 15.

² *Tribune mèd.*, 1904, No. 11.

³ *Jour. Am. Med. Assoc.*, Oct. 3, 1903.

⁴ *Deut. Zeit. f. Chir.*, vol. lxxi, Nos. 1 and 2.

⁵ *Wratschelbn. Gaz.*, 1903, No. 26.

⁶ *Chirurgia*, Bd. xii, No. 72.

in a patient aged 20 years. The process started with a small pimple at the base of the penis, and spread over the remainder of the genitals in the course of 4 weeks. Recovery followed expectant treatment. The patient preserved the hides of some dead cattle just before the onset of his illness.

Louis E. Schmidt,¹ in some remarks on **the limitations of urethroscopy**, says experience has shown that urethroscopic examinations not only have often been useless, but that frequently repeated urethroscopic manipulations have been distinctly harmful to the general condition of patients. The tube should admit of easy introduction. If small tubes are used, the sought-for information is not easily gained, while if a sufficiently large tube is employed and forced through very dense infiltrations, distinct reaction will follow, probably due to the carrying of infection to the deeper layers. There is a demand for urethroscopy during the course of a large number of cases of chronic gonorrhea; those cases that cause one to believe that one of certain localized processes is present and which does not yield to routine treatment. The localized processes may be infiltrated with ulcerations with a depressed center, hard granulations, coated fissures, encircling rigid infiltrations, involvement about and within the urethral glands, or other processes which tend to occur in patches. In superficial ulcerations the long and light gonorrheal threads are not found, but irregularly shaped flakes, usually thicker in the center and even dark in color, microscopically shown to be blood, will be found to float in the urine. The involved areas can be correctly located with the urethroscope only. The presence of coated fissures may be strongly suspected if the patient observes, after a nocturnal pollution or after the sexual act, and frequently after each urinary act, a distinct shock in the same place and continuing for some time. As a rule, these granulations will not yield except to heroic treatment through the urethroscope. Infiltrations of greater extent and rigidity manifest themselves by the appearance of a catarrhal secretion. It is important to locate these infiltrations and to diagnose their character, because different infiltrations call for an entirely different mode of treatment. The diagnosis and indications are made with the urethroscope. Another group of symptoms, those of a sexual character, forcibly suggest the use of the urethroscope.

I. H. Jacobs² presents a new obturator for the urethroscope (Figs. 30, 31). The obturator consists of a catheter with a central eye and a mandrin upon which a small hollow cylinder slides. To render the instrument ready for use, we introduce the mandrin as far as possible into the catheter, and then the whole obturator into the tube. When closed, the catheter should project over the tube by about 1 cm., while the mandrin will overlap the tube by about 4 mm. The closure of the tube through the catheter is more nearly perfect than can be obtained by the metallic obturator, without rendering the edges of the tube too pointed. Now, the instrument is introduced and the external sphincter is opened by the soft end of the obturator, with as much ease and as little pain to

¹ Med. News, Nov. 14, 1903.

² N. Y. Med. Jour., July 18, 1903.

the patient as is caused by the introduction of a catheter. In going further, the end of the catheter assumes the curvature of the urethra, so as to render the instrument a practically curved one. This part of the obturator being now adapted to the shape of the urethra, effects the opening of the urethra before it is straightened, rendering the stretching less violent. The straightening process itself is effected by the end of the mandrin, which is covered by the catheter. In this manner the mucous membrane is protected from lesions and tears. Now we introduce the instrument into the bladder, partially remove the mandrin, and then pull out the catheter far enough so that its end may overlap the tube but slightly. Through the agency of the above-mentioned



Fig. 30.—Jacobs' obturator.

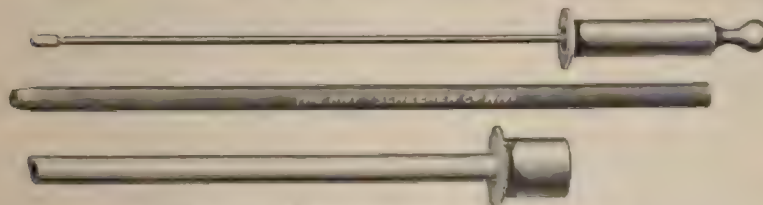


Fig. 31.—Jacobs' obturator with the parts separated.

small hollow cylinder, which is movable over the mandrin, we are able to determine positively when this has taken place. After this, the mandrin is removed, and when the urine commences to flow from the catheter, we move the whole instrument outward until the urinary flow ceases. Then we are certain that the end of the tube is placed in the desired position—namely, closely in front of the internal sphincter. After the removal of the catheter we are sure that the whole posterior urethra will be accessible to our view.

E. G. Mark¹ describes a new air-dilating urethroscope which has for its component parts an endoscopic tube; a universal head which is attachable to any size of endoscopic tube by a screw joint, and which has the valve attachment for the dilating bulbs; a light-carrier having at its distal end a mignon lamp and fitting into the universal head by a bevel joint, insuring an air-tight connection; an obturator having a universal handle and a glass window fitting into the light-carrier by a bevel joint. The light-carrier is adjustable to any size of endoscopic tube by means of a screw connection between the light-carrier shaft and handle. Added to the instrument is a glass operating window which has in its center a metal adjustable gland, fitted with a rubber gasket, insuring an air-tight contact between the operating instrument and the gasket and yet permitting of all necessary mobility on the part of the

¹ Jour. Am. Med. Assoc., Dec. 19, 1903.

instrument in use. The tube to be used is selected and the universal head is attached. The light-carrier is then placed in the universal head and so adjusted by the handle that the distal end of the light-carrier falls into the groove in the distal end of the tube. The obturator is then inserted, the connection made with the battery, and the instrument introduced the required distance. Then the obturator is withdrawn and the excess secretion mopped up. The bevel window is inserted and, the dilating bulbs having been attached, the penis is grasped in the left hand, while pressure on the bulbs with the right makes dilation. The collapsed, stellate folds of the urethra are obliterated, and the urethra comes into view as a tube, every point on the walls of which can be accurately observed. If the endoscope was properly selected and an excess of air-pressure is not caused, no air escapes along the sides of the instrument.

G. W. Penn¹ describes a **urethrotomy by the combined use of an anterior and a posterior sound used as guides**. The method is employed in cases of impassable stricture. A cannula is inserted into the bladder above the pubes, the urine withdrawn, and the bladder filled with salt-solution. A long silver sound is introduced through the cannula into the bladder and into the dilated proximal urethra. Another sound is passed into the penile urethra down to the stricture. This method facilitates the finding of the urethra by the perineum.

Casper² recommends a mixture of tragacanth, water, and glycerin, with 1:500 mercury oxycyanate as a lubricant for catheters and sounds. It is nonirritating and is very soluble in water, so that it does not interfere with inspection through the cystoscope.

Goldberg³ recommends for the **sterilization of catheters** a scrubbing with soap and water and boiling from 5 to 10 minutes. Antiseptics in solution are unreliable. He made a number of experiments with infected catheters and found that a current of steam at 100° C. was also effective.

R. F. Metcalf⁴ reports a case of **multiple calculi in the male urethra** causing occlusion. The patient was seen with an acute retention of urine, and by perineal section 6 stones, the largest 1½ inches in length and weighing 1½ grams, were removed from the membranous urethra.

B. B. Foster⁵ reports a case of needle in the prostatic urethra which was removed by perineal section. The patient claimed to have swallowed the needle.

V. Frendl⁶ reports a case of **foreign body in the urethra**. A soldier inserted into his urethra a roll of newspaper 12 cm. long and 5 mm. thick. Instrumental extraction could not be accomplished. The patient was directed to drink 5 glasses of water. One-half hour later olive oil was injected into the urethra and the patient directed to urinate with as much force as he could exert. By this means the foreign body was expelled.

¹ Jour. Am. Med. Assoc., Jan. 9, 1904.

² Deut. med. Woch., 1903, No. 46.

³ Zent. f. Krankh. der Harn- u. Sexual-Organen, vol. xiii, Nos. 7 and 8.

⁴ Jour. Am. Med. Assoc., May 14, 1904.

⁵ Med. Rec., Nov. 14, 1903.

⁶ Wien. klin. Woch., 1903, No. 33.

Raymond Gregorie¹ says **tumors of the female urethra** are seldom situated in the deeper portions, where the adenomatous and connective tissue is abundant. They are most frequently found about the meatus, in the form of papilloma. The chief symptoms are pain and hemorrhage. Etiologically may be considered irritations, urethritis, and the constricted portion of the canal at this point. The richness of the tumor in vessels may be explained by the recurring turgescence of the genitals during the menstrual period.

J. De Smeth² reports 2 cases of **urethral polyps**. In the first case, a boy 14 years old, who had the symptoms of stone, a papilloma was found in the posterior urethra by means of the Casper endoscope, and was removed by the galvanocautery. The second case was somewhat similar, but followed a gonorrhea, occurred in an adult, and the tumor was not completely removed.

J. E. Morrow³ reports 2 cases of **growth of the male urethra**. In the first case, a male, aged 49, 20 polyps were removed by the snare, one came away spontaneously, and a large number were removed by means of applications of chromic acid, 100 grains to the ounce. The second case, aged 31 years, was diagnosed as follicular prostatitis. In this case a growth the size of a large pea was removed from the prostatic urethra with alligator forceps. The third case, aged 42 years, had a growth the size of a large broom straw attached to both the roof and the floor of the urethra; this was removed with urethral forceps. The symptoms of urethral growths are gleet discharge, frequent micturition, obstruction, retention, dribbling and incontinence of urine, hematuria, urethral hemorrhage, sometimes very copious, sexual hyperesthesia, impotence, and tenderness at the point of location of the growth. The treatment is enucleation with a knife, scissors, cautery, or loop, or the application of strong astringent and caustic solutions. This can be accomplished by external urethrotomy or through the urethra. If the urethra is large enough to admit a No. 28 F. or larger tube, removal can readily be accomplished with the urethroscope.

J. Basil Hall⁴ has compiled a list of 21 cases of **primary carcinoma of the bulbus urethræ** in which the diagnosis has been confirmed by microscopic examination. There are also on record 5 cases in which no such examination was made, and 3 cases in which⁵ the growth arose primarily in Cowper's glands. Primary cancer of the urethra occurs in men over 50 who have most commonly suffered from some previous disease of the canal, usually gonorrheal stricture. The most prominent symptom is the gradual formation of a hard, lobulated mass around the urethra. Micturition becomes increasingly difficult and is almost always very painful—far more so than in simple stricture. Hemorrhages, especially before and after micturition, are a common symptom. As the growth extends the crura and corpora cavernosa become implicated, and the disease advances past the scrotum into the penile

¹ Ann. des Mal. des Organes Genito-urin., 1904, No. 5.

² Soc. Belg. d'Urologie, Dec. 6, 1903.

³ N. Y. Med. Jour., Oct. 3, 1903.

⁴ Ann. of Surg., Mar., 1904.

portion of the urethra. The glands in the groin enlarge and the patient becomes cachectic in appearance. The passage of instruments is from the beginning difficult, and is always followed by bleeding. A differential diagnosis between malignant disease and simple induration is frequently impossible prior to operation, excepting when the size of the perineal swelling is out of all proportion to that usually found associated with simple stricture. In half the cases the treatment has been palliative, and in the other half radical, after excluding one case in which no treatment was adopted. Of the cases treated by resection, the result is unrecorded in 1, death occurred within 9 months in 4, 1 had a recurrence within 6 months, and of the remaining cases the subsequent history is incomplete in all. Extirpation is worth a trial, as the growth spreads invariably toward the penis and shows no tendency to invade the prostate and tissues behind the triangular ligament. Lymphatic infection occurs in the inguinal glands, and is, therefore, also amenable to surgical treatment.

A. L. Chute¹ reports a case of **tuberculosis of the urethra**. A married man, aged 35, who had never had venereal disease, had suffered for 2 years from painful and frequent micturition, hematuria, slight urethral discharge, painful erections, and dyspareunia. The stream of urine gradually became smaller and was followed by dripping. The urine contained a trace of albumin and a few shreds which showed urethral and pus-cells, cocci and bacilli, but no gonococci. The urethra felt like a stiff tube, and $1\frac{1}{2}$ inches from the meatus and at the penoscrotal angle was a hard, bulbous enlargement. On moving the urethra laterally crepitus could be felt. A probe passed into the urethra gave a grating sensation as it passed the enlargements. The inguinal glands on each side were enlarged. The prostate was also enlarged. A search for tubercle bacilli proved negative. After removal, the inguinal glands showed amyloid infiltration. Endoscopy showed a pale, fibrous-looking canal with an occasional eroded spot and whitish points here and there. The diagnosis of tuberculosis was made because of the nonvenereal history, the course of the disease, and the condition of the inguinal glands. Urethral tuberculosis is most common during the period of sexual activity. Men are affected more frequently than women. Gonorrhea seems to be a predisposing cause. Sometimes it spreads from the glans penis, and the primary infection is almost invariably in some other portion of the genitourinary tract.

Bakaleinik² describes a **hydrodilator for the treatment of stricture of the urethra** and for the dilation of other canals (Fig. 32). It consists of a cylinder with a screw attachment, by means of which water may be forced into a dilatable rubber tube. It is claimed that there is less injury to the canal than when other means are used, and that there are little pain and no spasm. The instrument is so graduated that the amount of dilation may be determined by reading a scale on the plunger.

Desnos³ has obtained, by means of the **electrolytic treatment of**

¹ Boston M. and S. Jour., Oct. 1, 1903.

² Berl. klin. Woch., 1903, No. 37.

³ Ann. des Mal. des Organes Genito-urin., 1903, No. 18.

stricture of the urethra, good and lasting results. He describes his instrument and the technic, and reports 25 cases treated. In 16 of these cases other methods had been employed with poor results. There were no complications, and in two-thirds of the cases the accompanying chronic urethritis was cured.

Bonnet and Bazy¹ report a case of **obliteration of the urethra by a congenital valve** in the form of a diaphragm. A young soldier had had urethral trouble since childhood. During his eighteenth year he suffered from retention of urine, due to a urethral stone which was spontaneously expelled. Since that time there have been recurring attacks of retention. Obstruction was encountered in the bulbus urethræ. At operation a membrane was found in the form of a diaphragm, closing the entire lumen of the urethra. This portion of the urethra was resected and the remaining segments sutured. Recovery was uneventful.

C. Bruni² reports 100 cases of **urethrotomy**; 49 were seen from time to time, 14 returned with recurrence, and 37 were lost sight of. Of the bloody operations, he prefers internal urethrotomy with the urethrotome of Maisonneuve. With antisepsis and improved technic the operation is not dangerous and is followed by good end-results.

Rafin³ thinks that **linear electrolysis for stricture of the urethra** is a safer operation than internal urethrotomy, because the charred surface is not so apt to absorb infectious material. Nogues reports 980 cases of internal urethrotomy with 11 deaths. Rafin has had one death after internal urethrotomy and one after linear electrolysis. It is generally advisable not to use more than 20 milliamperes for electrolysis. When this does not suffice, it is safer to perform internal urethrotomy rather than increase the current. The method is not applicable to all cases, for instance, in strictures caused by periurethral growths. In all cases it is necessary to use sounds both to complete and to maintain the dilation.

H. L. E. Johnson⁴ reports 6 cases of **stricture of the female urethra**. The causes of this condition are congenital malformation, traumatism, internal or external, associated with prolonged or instrumental labors, injuries of the genitals from burns, scalds, falls, cicatrices following operations, inflammation and infection from venereal disease and septic

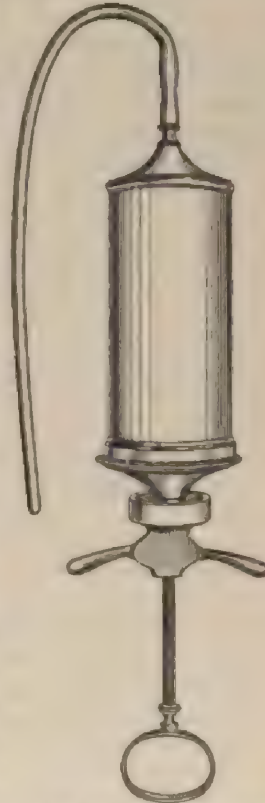


Fig. 32.—Bakaleinik's hydrodilator for treatment of urethral stricture (Berl. klin. Woch., 1903, No. 37).

¹ Soc. de Chir., Jan. 14, 1903.

² Monats. f. Urologic, 1903, vol. xviii, No. 11

³ Lyon méd., Sept. 20, 1903.

⁴ Jour. Am. Med. Assoc., Apr. 2, 1904.

instruments. Tumors within the urethra are said never to cause stenosis or atresia. The symptoms resemble those of cystitis—frequent, scanty, painful or difficult urination or retention. In some instances the urine is normal, leading to error in diagnosis by directing suspicion to surrounding organs. Infrequency of the disease causes delay in diagnosis, therefore no physical examination in diseases of women should be considered complete until the catheter has been passed into the bladder.

J. Lyon Thomas¹ reports a case of **severed vas deferens**. An oblique incision was made over the inguinal canal and the spermatic cord uncovered. The testicular end of the vas was cut obliquely by means of a cataract knife. The distal or urethral portion of the vas was split up longitudinally for about 1 inch; this free end was further divided for about $\frac{1}{2}$ inch from its extremity, so as to provide 2 tails of equal size. (See Figs. 33, 34.) The obliquely cut free end of the testicular portion



Fig. 33.—Method of preparation of the urethral end of the vas deferens. The tails, *a a'*, are wrapped around the testicular end of the vas and fixed by sutures after the obliquely cut end of the testicular portion is fixed to the grooved wall beyond the tails (see *j*, Fig. 34) (Thomas, in Brit. Med. Jour., Jan. 2, 1904).

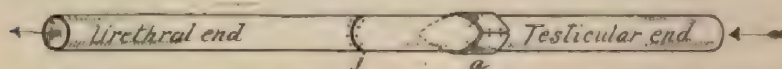


Fig. 34.—*j*, Union of urethral and testicular portions of the vas deferens. *a*, The tail wrapped around testicular end of vas. \longleftrightarrow shows direction of semen traveling along vas (Thomas, in Brit. Med. Jour., Jan. 2, 1904).

was placed with its lumen in contact with that of the urethral portion, and was fixed by means of fine silk suture as closely applied as the cord-like nature of the vas would admit. The 2 tails of the distal end were then enveloped around the testicular portion of the vas in order to counteract the disruptive force of the weight of the testis. Afterward layers of fascia were wrapped around the anastomosed vas and fixed by sutures. The result was perfect.

Edward M. Corner² gives the following summary of operative procedure for **imperfectly descended testes**. Orchidopexy is applicable only in mild cases of imperfectly descended testes, and perhaps even then it may not be even called for. Orchidectomy is justifiable only under special pathologic conditions, for example, torsion, severe neuralgia, extreme atrophy, and so forth, and in older cases, that is, after the occurrence of puberty and a possible and problematic period of activity in spermatogenesis has passed—say from 23 upward. Replacement in the abdomen is indicated in by far the majority of cases, and should be always done before puberty, and, perhaps, up to the age of 20 or thereabouts. It would appear that the earlier the operation is performed,

¹ Brit. Med. Jour., Jan. 2, 1904.

² Brit. Med. Jour., June 4, 1904.

the better should be the result. No operation may be called for in mild cases when the testes are close to the bottom of the scrotum, or when the testes are abdominally retained. Operative interference is demanded in most cases on account of the secondary changes of an inflammatory and sclerotic nature in the testis, which the position of imperfect descent leads to. Again there is the frequent coexistence of a hernia with this condition. And in cases where it is not often or has never previously come down, the narrow opening or neck of the sac may cause one of the most dangerous varieties of strangulation.

A. D. Bevan¹ describes **his operation for undescended testicle**. When the organ is palpable, that is, in the canal or the external ring, the following technic should be pursued: Make an incision 3 inches long over the canal. This should never involve the scrotum. The external oblique, the cremasteric fascia, and the thin underlying transversalis fascia are divided, and the large peritoneal sac containing the testicle and continuous with the general peritoneal cavity exposed. The peritoneum is cut across at the upper and outer angle of the wound, and is carefully separated from the cord which lies beneath. The vaginal process is then ligated, as is the neck of a hernial sac, care being taken to ligate well up at the internal ring. That portion of the peritoneal sac in contact with the testicle is closed with a purse-string suture, and thus forms a tunica vaginalis for the testicle. The testicle is now lifted out of its bed, and the cord is gently pulled on, so as to lengthen it as much as possible. In doing this, shortened bands of connective tissue will be seen as tense spans in the cord, and these should be torn across with tissue forceps. The cord should thus be stripped of all surrounding fascia, leaving nothing but the vessels and the vas deferens. The spermatic vessels and the vas, which lie behind the posterior layer of peritoneum, should be separated from the peritoneum by blunt dissection. The spermatic vessels pass upward and inward and the vas downward and inward from the internal ring. The cord should be so lengthened by these maneuvers that the testicle can be laid on the thigh, 3 or 4 inches below Poupart's ligament. With blunt dissection with the finger a large pocket should be made in the scrotum and the testicle dropped into it, where it should remain without tension on the cord. A purse-string suture should now be placed at the neck of the scrotum to retain the testicle in position. This suture should pass through the superficial fascia and the external oblique on both sides of the incision. The incision is then closed as in the Bassini operation, except that the cord is not transplanted. In cases in which the testicles are not palpable and in some in which the testicles are palpable this method does not free the testicle sufficiently to bring it into the scrotal pocket without tension. The tense structures which prevent reduction are the spermatic vessels and not the vas. The spermatic vessels run in almost a straight line from the internal ring to the abdominal aorta and the ascending vena cava and renal vein. The vas, on the other hand, makes a long sweeping curve from the internal ring to the base of the bladder. The

¹Jour. Am. Med. Assoc., Sept. 19, 1903.

artery of the vas accompanies it and follows this same curve. The vas is the essential organ in the spermatic cord. The spermatic vessels may be safely sacrificed in those cases in which the testicle cannot be sufficiently freed without dividing them.

W. Bolejuboff¹ has performed **anastomosis of the vas deferens** on 41 animals, including the horse, sheep, dog, and cat. In 34 instances he resected the epididymis and sutured the vas deferens in the testicle; in 48 instances he resected the lower half of the epididymis and sutured the vas into the upper half. As the result of his work he makes the following statements: Anastomosis of the seminal canal in a few cases gives an anatomically perfect result. The best method seems to be the anastomosis between the vas deferens and the upper half of the epididymis. After anastomosis between the vas deferens and the canal of the epididymis a patent seminal canal will, without doubt in a considerable number of cases, result. More often the anastomosis between the vas deferens and the canal of the epididymis will be found to consist of an intermediate cavity between the two ends of the seminal canal.

Roussy² has treated 34 cases of gonorrheal **epididymis** by injecting into the lumbar vertebral canal 3 cc. of a 1 % solution of cocain. In 23 cases pain disappeared immediately or within an hour, and 4 times after a longer period, without return; 6 times the pain returned, and once the result was not satisfactory. There were lessening of fever and a general improvement in the patients. There were never any symptoms of poisoning except slight vomiting in one case.

R. C. Lucas³ reports 3 cases of **influenzal orchitis**, 1 a 31-year-old man, 1 an 8-year-, and 1 a 3½-year-old boy. In 2 of the cases it involved one side and in the third both testicles were affected. All 3 recovered.

Tuffier⁴ reports a case of **gangrene of the testicle due to torsion of the cord**. A young man with an ectopic testicle (inguinal) attempted to urge the organ into the scrotum by massage. He was suddenly seized with symptoms resembling strangulated hernia. At operation the testicle was found necrotic and the cord was twisted. Recovery followed castration.

A. T. Cabot⁵ reported a case of **strangulation of the testis due to torsion of the cord** before the American Association of Genito-urinary Surgeons, May, 1903. The patient was 26 years old. Without previous injury he was suddenly seized with severe pain in the center of the lower abdomen, just above the pubes. He was pallid, nauseated, and covered with sweat. Two days later the gangrenous testicle was removed, the cord being completely twisted upon itself.

G. H. Edington⁶ reports a case of **strangulation of a fully descended testicle from torsion of a pedunculated mesorchium**. The patient was a baby, aged 7 months. There were no history of injury and no constitutional symptoms, and locally the left half of the scrotum was swollen, resembling an orchitis. After incision the testicle was found necrotic

¹ Arch. f. klin. Chir., Bd. lxxii, H. 3.

² Brit. Med. Jour., July 25, 1903.

³ Med. Rec., Sept. 12, 1903.

⁴ Tribune méd., 1904, No. 2.

⁵ Soc. de Chir. de Paris, May 20, 1903.

⁶ Lancet, June 25, 1904.

and hanging free in the tunical sac, the mesorchium being represented by a small, pedicle-like structure completely twisted from right to left.

Wm. B. Coley¹ reports 15 cases of **malignant tumor of the testis**. Malignant disease of the testis is far more likely to be sarcoma than carcinoma. The disease is rare in children, but frequently occurs in young adult life. Trauma plays a strong part in the etiology. In the 105 cases of sarcoma collected by Kober, 43 % gave a history of antecedent injury. Of Kober's cases, 9 were free from recurrence from 3 to 15 years after operation. The only proper treatment is complete removal of the testis and cord as high up as the internal ring. In addition to this Coley strongly advises a course of treatment with the toxins of erysipelas and *Bacillus prodigiosus* for 2 or 3 months after operation as a prophylactic measure. In cases of doubt the dangers of delay are so great that immediate exploratory operation is demanded, with castration, if section of the tumor confirms the suspicions of sarcoma. One should never remove a section and wait for microscopic diagnosis, since the danger of infected cells being carried to remote parts by the blood current is a real one.

Joseph A. Blake² says castration is the proper operation when both the testicle and the epididymis are tuberculous. When the epididymis alone is involved, many advocate epididymectomy. Blake prefers castration unless both sides are diseased, when he leaves one testicle if possible. The gland is useless when the epididymis is removed unless for internal secretion, and one testicle suffices for that. In all his operations for **tuberculosis of the testicle** he removes the vas deferens and usually a portion of the ampulla. The infected seminal vesicle should be excised in every case in which the disease is limited to the genito-urinary tract, for the following reasons: First, that tuberculous foci in general should be removed as far as possible, and, secondly, to prevent implication of the remaining testicle and the urinary tract. In removing the vas with the testicle, the testicle is first excised, with any skin that may be invaded; the incision is then carried up to the internal ring. The vas having been separated, the remainder of the cord is divided, and the vas being drawn upon, the peritoneum is pushed away from it with the finger until it is freed down to the ampulla. The ligature is then tied about it as low down as possible, or it is caught by the finger of the other hand separating it at the ampulla. By this method a portion of the ampulla is generally removed with the vas. The scrotum is attacked through Zuckerkandl's curved scrotal incision. After freeing the dorsal surface of the prostate the urethra is removed by incising the layer of the prostatic capsule and drawing it out. It can then be shelled out without much difficulty, and it is possible to see any lesion in the prostate and to attack and remove it as it may require.

C. G. Cumston³ concludes in favor of castration for tuberculosis of the testicle by saying that tuberculous testis is a disease of the

¹ Med. News, July 25, 1903. ² J. Urol. Surg., vol. 1, p. 107, 1903.

³ American Medical Association, 1903.

to become obsolete; that castration has an exceedingly low mortality, considered as an operation, and that if performed at an early period of the disease, there is a good chance of preventing further infection from the bacillus of tuberculosis from taking place. Castration certainly complies with one of the most urgent demands of modern therapeutics, namely, the eradication of the soil breeding the disease, when, of course, the affection has not been present for too long a period and has not extended to other parts of the body. Conservative surgery applied to the testicle is practically useless when the organ is affected by tuberculosis, and it allows the dangerous consequences to arise which the radical treatment directly tends to avoid.

Phocas¹ has had a hematoma form in 7 cases of **varicocele** which he had treated by resection of the scrotum. Resection of a varicocele is not without danger, and may be followed by a recurrence. He has operated on 4 cases by the Paronass method, with satisfactory results. An incision is made into the scrotum, and the scrotal ligament that connects the testicle with the fundus of the scrotum is severed and sutured to the pubic bone in order to prevent the testicle from resuming its old place in the scrotum. The operation is completed by fixing the tunica fibrosa to the pillars of the inguinal ring by two sutures. In 2 other cases in addition to the foregoing he lessened the size of the scrotum below the testicle by a simple continuous suture.

A. Breneau and H. Condo de Satriano² report a case of **fibroma of the spermatic cord**. A 45-year-old patient had received a horse-kick in the left side 24 years before. Six months since a reducible tumor was noticed in the left inguinal region. This was treated for hernia. For 3 months the tumor had been irreducible and the seat of colicky pains. At operation the tumor was found to be a fibroma of the spermatic cord. The tumor weighed 180 gm. The authors found 6 other cases in the literature.

DISEASES OF THE BLADDER AND PROSTATE.

The following are the conclusions of Alexander B. Johnson³ after a discussion of **tuberculosis of the urinary bladder**: "1. If other tuberculous lesions of the genitourinary tract exist, their operative removal is sometimes followed by improvement and even cure of the process in the bladder, provided the patients are placed under the most favorable hygienic surroundings. 2. Operative treatment of the bladder alone in the presence of tuberculous lesions of other portions of the urinary tract is usually harmful rather than beneficial. 3. The local treatment of the tuberculous bladder by means of injections or applications through the urethra is generally useless and often very deleterious. 4. The internal administration of the drugs known as urinary antiseptics is generally useless. 5. Palliative operations, such as suprapubic drainage, may be useful in advanced cases. 6. The general or hygienic

¹ Jour. Med. de Brux., 1903, S. 709.

² Rev. de Chir., Jan. 10, 1904.

³ Med. News, May 14, 1904.

treatment, suitable climate, out-of-door life, etc., offers these patients the best hope of recovery. 7. Such hygienic measures should be preceded by the operative removal of tuberculous foci in the kidney, the epididymis, the prostate, and the seminal vesicles, if such exist and the patient is still in sufficiently good condition to bear the operative procedure. 8. In those rare cases where the bladder alone is affected over a moderate area only, the operative removal or destruction of the diseased tissue may be followed by improvement and even cure."

Frank Hartley¹ (New York) deals with **extirpation of the urinary bladder**. He has been able to collect 23 cases of total extirpation of the bladder for malignant tumors. The ureters were treated by different methods, rectal implantation being the most frequent. Of the 23 patients, 11 died. Hartley believes that the entire extirpation of the bladder is the procedure of choice in cancer. The choice of methods of dealing with the ureters in the male offers but little advantage one over the other. Statistics, however, seem to favor the urethral or cutaneous implantations. Tuberculosis necessitating extirpation of the bladder is next discussed. Whatever operative treatment is pursued in tuberculosis of the bladder, the importance of hygienic and climatic treatment should not be neglected. He reports a case of extensive tubercular disease of the bladder in a girl 18 years of age. In this case he extirpated the bladder and implanted the ureters, with a portion of the bladder-wall, into the sigmoid. This patient, who was in a dreadful condition before the operation, made a good recovery, and a month after the operation voided urine by the rectum only 3 times daily and once or twice at night. Nine months after the operation she was in good health and employed as a clerk. Two other cases operated upon by Hartley are also referred to, in which good results were obtained by rectal implantation of the ureters. Forty-six cases of exstrophy of the bladder treated by extirpation and implantation of the ureters into the sigmoid or rectum have been collected. These cases show a mortality of 15 %. Of these 46 cases, one case was seen 4 months after operation; 15 cases were seen 1 year after operation; 13 cases were seen 2 years after operation; 9 cases were seen 3 years after operation; and 1 case 7 years after operation. The best methods of treating this condition, provided the construction of a continent bladder is impossible, seem to be: (1) Cystectomy with the intestinal anastomosis of Maydl or Pozzi; (2) vesicorectal anastomosis (Frank); (3) extirpation of the bladder and urethral implantation of the ureters (Sonnenberg); (4) extirpation of the bladder and vaginal implantation of the ureters (Pawlik).

The **treatment of vesical papilloma by injections** is discussed by Herbert T. Herring,² who reports 3 cases in which this treatment has been carried out, and from them draws the following inferences: "1. Recurrence of papilloma after removal by suprapubic cystotomy, which unfortunately very frequently occurs, may be effectually held in check by injections of silver nitrate. 2. If injections are made, when it has

¹ Med. News, Aug. 29, 1903.

² Brit. Med. Jour., Nov. 28, 1903.

been found impossible to remove the growth entirely by operation, the recurrence of the symptoms is retarded longer than could be expected without the treatment. 3. Much of a tumor may be removed by the urethra without serious hemorrhage, and a result gained equal in some cases to that of a suprapubic operation. 4. There is reason to hope that papillomatous growths may be entirely destroyed by long-continued applications of silver nitrate. The conclusions, therefore, which may be drawn, although confirmatory evidence is needed, are: (a) Injections should be made after operations for the removal of the growth, whether the operator is satisfied that he has done so efficiently or not. (b) The urethral route should be tried, when removal of the papilloma is contemplated, before a more serious operation is undertaken."

A. P. Weaver¹ (Philadelphia) reports an **unusual case of foreign body in the bladder**. The patient was 2½ months pregnant, and with the idea of ending the pregnancy the husband introduced a "sponge tent," as he supposed, through the uterine os. Twenty-four hours later the patient was suffering a great deal of pain, with marked vesical tenesmus, and had passed large quantities of blood by the urethra. The tent was with great difficulty removed from the bladder after extreme dilation of the urethra. The recovery was very prompt.

Elliot² (Boston) describes a unique case of **fibrinous vesical concretions**. The patient, who was a man 54 years of age, gave a history of frequent attacks of vesical tenesmus with bleeding extending over 6 years. Twice he had passed a small stone by the urethra. On a previous occasion he had been operated upon for inguinal hernia, but at that time no evidence of stone in the bladder could be found. Although the patient's symptoms clearly pointed to a foreign body in the bladder obstructing the flow and exciting hemorrhage, a careful examination with a searcher and with a Bigelow evacuator revealed nothing. When two fingers were introduced into the rectum, however, a mass at the base of the bladder could be felt by bimanual palpation. Suprapubic cystotomy was done, and two large smooth, ovoid, soft masses about the size of a small hen's egg were removed. The patient made a satisfactory convalescence. On section, the masses removed were found to be laminated, and between some of the layers fluid was found. The structure was homogeneous, slightly gritty, giving the impression of coagulated material, fibrin, and mucus, mixed with particles of urinary salts, in the center of which was a small nucleus measuring about 2.5 cm. in greatest extent, composed of inorganic material (Plate 6). The diagnosis was fibrinous concretions about a calcium phosphate nucleus.

H. Betham Robinson³ reports a case of **intraperineal rupture of the bladder** in a girl aged 5 years. It is thought that this is the youngest patient operated upon for this condition. The wound in the bladder was closed with silk sutures which did not penetrate the mucosa. A drain was introduced and a catheter placed in the urethra. The patient made a good recovery.

¹ Amer. Med., Apr. 30, 1904.

² Ann. of Surg., Feb., 1904.

³ Lancet, Jan. 23, 1904.

PLATE G.



Fibrous concretions about a calcium phosphate nucleus. From bladder (Elliot, in Ann. of Surg., February, 1904).

I. S. Stone¹ (Washington, D. C.) reports a case of **perforation of the urinary bladder by an appendiceal abscess**. The patient was a woman who came under his care 2 months after a definite attack of appendicitis with abscess-formation. The patient recovered from the attack after the discharge of a large quantity of pus through the bladder. When seen by Stone, a mass could be felt in the right iliac region and there was some irritability of the bladder. The abdomen was opened for the purpose of removing the appendix. This organ was found firmly adherent to the bladder, and when separated, there was no opening between the two organs. When the separation was done, however, the end of the appendix was opened and the bladder-wall was very thin at this point. Stone appends a list of 31 other authors who have reported similar cases. [Gibbon operated upon a case of appendicitis in which pus was discharged with the urine, and in which the appendix was found firmly adherent to the bladder. No patulous opening between the two organs, however, was found in this case. The adhesion was so dense that the bladder-wall could be easily lifted up when traction was made upon the appendix.]

The treatment of **abnormal frequency of urination by epidural injections** is discussed by Valentine and Townsend.² The paper is based on a study of 8 cases, which are reported in detail. The following are the authors' deductions from a study of the reported cases: 1. Epidural injections with decinormal salt-solution offer the most promising results in abnormalities of urination due to faulty vesical innervation. 2. Incontinence of urine, enuresis, excessive frequency of urination (unless due to other pathologic conditions) can at least be ameliorated by epidural injections. 3. Cautiously performed, epidural injections are in no wise dangerous to the patient. 4. Epidural injections are no more painful than any hypodermatic injection with a mild solution. 5. Epidural injections can be performed by any one who follows the technic outlined, and is alert to those anatomic variations which are so frequent in the region. 6. The immediate effects of epidural injections are very rarely even disagreeable.

Albert Freudenberg (Berlin), in a communication before the Seventh Session of the Association Francaise d'Urologie, Paris, 1903, recommends **intravesical injections of iodoform in the treatment of ammoniacal cystitis**. This treatment is particularly recommended in cases of ammoniacal urine with decomposition and odor. The injection should not be used indiscriminately, but only in proper cases. The difference between this injection and others, such as silver nitrate, is that the silver nitrate acts upon the bladder-wall, whereas the iodoform acts upon the urine itself. The iodoform is employed until the urine becomes acid, when the ordinary treatment for a cystitis with acid urine can be followed, such as the application of silver nitrate or any other agent which may be preferred. When the iodoform does not modify the ammoniacal urine and free it of its odor, it is positive that there is some complication which interferes with the action of the

¹ Ann. of Surg., Feb., 1904.

² Med. Rec., Sept. 26, 1903.

drug. The complication may be a foreign body, such as a calculus; it must not be supposed, however, that the calculus will always interfere with its action, as Freudenberg has been able to demonstrate its action in the presence of several calculi. A diverticulum of the bladder also may interfere with the action of the iodoform on the urine, as the drug may not reach the inaccessible sac. In the cases of hypertrophy of the prostate with complete retention and decomposition of the urine the action of the iodoform is most prompt and satisfactory. It must be remembered, however, that the drug is capable of producing toxic symptoms and must be used prudently. Freudenberg has seen a case in which poisoning occurred from absorption and lasted for 6 weeks. On this account he has endeavored to find some satisfactory substitute for the iodoform and has used many of those which have been put upon the market, but none of them proved so satisfactory as the iodoform itself. Freudenberg makes the injections every second day and later less frequently. He has been able to demonstrate that an injection every 48 hours is sufficient, since he has been able to find iodoform in the base of the bladder at the end of that period. The iodoform is suspended in glycerin 1 part to 10, and when the solution to be injected is to be made, 3 cc. of this mixture are added to 30 or 40 cc. of a non-irritant liquid, such as a solution of boric acid or a very weak solution of silver nitrate. Before injecting the iodoform solution the bladder is carefully irrigated. In another brief communication Freudenberg also recommends the use of **camphoric acid as a prophylactic against the occurrence of urinary fever, especially after the Bottini operation.** He refers to his unsatisfactory results with other prophylactic agents, but states that so great is his confidence in the action of this drug that when the fever occurs in spite of its use, he believes it to be indicative of sepsis. It should be understood, however, that the drug does not prevent an insignificant rise of temperature. It is administered in a powder or capsule, 1 gram 3 times a day. Where an operation is to be performed, such as the Bottini, the administration is begun some days before its performance and kept up for some days after it. It has also been discovered that the drug exerts an excellent action in cases of cystitis, equal to and in some cases exceeding that of urotropin.

An exhaustive article on the **operative treatment of the hypertrophied prostate, with special reference to its evolution, present status, and the choice of operative method and technic,** is presented by Watson¹ (Boston). This article contains a description of the various operations which are at present in vogue and numerous illustrations. After presenting this very complete study of the subject Watson reaches the following conclusions: "1. The most important single factor in determining whether or not radical operative treatment should or should not be applied is the capability or the reverse of the renal function. Other than this are the general strength or feebleness of the patient, his comfort or suffering, and the probability of the continuance of the

¹ Ann. of Surg., June, 1904.

one or the occurrence of the other if operative treatment is *not* applied. 2. Radical operative treatment has not yet reached the status at which we are justified in saying that all cases of prostatic hypertrophy should be submitted to it as soon as the condition is clearly made out and has begun to give rise to slight symptoms. But we are justified in saying that patients should be given the benefit of it at a much earlier stage of the malady than it has been customary to apply it, and that where it is applied by those skilled in its performance, as soon as the hypertrophy can be clearly detected by examination, and if at the same time it is already giving rise to well-marked symptoms, and the patient's condition is not unfavorable to the performance of an operation of this magnitude, the mortality of operation, *if it is performed at that time, will be trifling, and the risks not nearly so great as is entailed by the use of the catheter, assuming the latter to have been employed instead and under the same conditions.* 3. The operations should be undertaken under favorable circumstances as soon as the above conditions occur. 4. With regard to choice of operation, the following are Watson's conclusions: Under conditions in which there is nothing to prevent a free choice of method—(a) The total removal of the gland by the best of the perineal technic is that of choice; (b) when any condition is present which makes the perineal operation too difficult of performance or is a contraindication of any sort to its application, the suprapubic operation is the operation of choice, and when contraindications are present which make this operation undesirable, the Bottini becomes the operation of choice, and when the patient's condition is such as to make any of the above 3 methods inappropriate, and we are obliged to do something, we will do a palliative operation for drainage. Cystoscopic examination should, when it can be readily done, precede operations of all sorts in which there is any doubt as to the exact nature of the hypertrophies, and is essential to the proper performance of the Bottini. Its utility with regard to the other operations is that of learning whether or not there is present a middle lobe of such size and position as to make the perineal operation especially difficult of performance."

Joseph Weiner¹ reports 6 cases of **suprapubic prostatectomy done under nitrous oxid anesthesia**. The following are his conclusions regarding this subject: "1. Suprapubic prostatectomy can be rapidly and safely performed under laughing-gas. 2. Any patient who can stand laughing-gas for 10 or 12 minutes can have the operation performed. 3. Old age, diabetes, and cystitis are no contraindications. 4. All the contraindications usually mentioned are contraindications not for the operation, but for the administration of ether or chloroform."

The question of **when and how shall we operate for obstructing hypertrophy of the prostate gland** is discussed by Paul Thorndike,² who emphasizes the following points: "1. The catheter has as wide a range of usefulness as it ever had in the palliation of obstructing prostatic hypertrophy. 2. The various operative procedures at present at our command are to be resorted to, with the exception of small classes of

¹ Jour. Am. Med. Assoc., May 14, 1904.

² Med. News, Apr. 23, 1904.

cases, after the catheter has ceased to palliate. 3. The time for this operative interference is at the moment when the catheter has ceased to palliate, and not after months or years of further and unavailing struggle to make it do so. 4. The more radical operation of enucleation, on the one hand, and the Bottini operation with its various modifications, on the other, are not procedures of the same kind, do not have the same object in view, and are in no sense to be weighed in the balance, the one class against the other. They should rather be contrasted, the one class as radical operations aiming at a cure, and the other as efficient palliating procedures, each having its own distinct indications for its appropriate use."

Gilbert Barling¹ presents a paper on **prostatic enlargement and its treatment by Freyer's operation** which is extensively illustrated. The following are the conclusions: "1. It is possible to enucleate the prostate. 2. The prostatic urethra is then almost invariably, if not always, removed with the organ. 3. If the prostatic urethra were left, it would necrose from want of blood-supply. 4. Stricture does not follow the damage to the urethra. 5. The operation gives excellent results, often restoring the functions of the bladder to an absolutely normal condition."

John B. Murphy² reports **51 cases of prostatectomy** occurring within a little less than 3 years, and discusses **prostatic hypertrophy**. The following are his conclusions: "1. The perineal route gives the best ultimate result. 2. It is accompanied by less danger than the suprapubic or Bottini operations, as regards—(a) hemorrhage; (b) sepsis; (c) injury to the neighboring structures; (d) life. In fleshy patients the hemorrhage is more profuse, repair slower, and the urethral fistula lasts for a longer time. 3. The drainage is excellent, and favors rapid restoration of the bladder to its normal condition. 4. The period of wound repair is much shorter than by the suprapubic route. All cases had primary union down the drainage-tube. 5. The vesical control is almost uniformly good. 6. The sexual power is usually destroyed. 7. The relief of vesical irritation is great, and the frequency of urination is reduced to about normal." The cases are reported in detail, and in many of them the final result at varying periods after the operation is given.

After dealing with the questions of **when and how we shall operate for prostatic hypertrophy** Willy Meyer³ reaches the following conclusions: 1. In view of the present advanced status of prostatic surgery, the catheter should no longer be advised as a *routine measure* in the surgical treatment of the disease under consideration. 2. Operative intervention should be urged as soon as the time for the regular use of the catheter has come. 3. Prostatectomy, being the most radical as well as the most surgical procedure, commands the first place in the treatment of the hypertrophied prostate gland, especially since the technic has been perfected to such a point as to render the operation a comparatively

¹ Brit. Med. Jour., Jan. 30, 1904.

² Jour. Am. Med. Assoc., May 28, June 11, 1904. ³ Med. Rec., June 25, 1904.

safe one, the mortality having been shown to be less than 5%. 4. The perineal route seems preferable to the suprapubic, for the reason that it enables the surgeon to do the operation more under the guidance of his eyes. 5. The choice of route in the average case will probably hinge on the question of preservation of sexual power, provided this point is of importance to the patient. 6. The patient's age, as such, does not furnish a contraindication to operation; it is his general condition merely that has to be taken into consideration. 7. Where the effects of general anesthesia are feared, spinal anesthesia is indicated. 8. If the operation with the knife is refused or contraindicated, Bottini's operation should be advised, since it, too, yields excellent results. 9. Thus, we have two useful methods of operation for prostatic hypertrophy, viz., prostatectomy by the perineal or suprapubic route, and Bottini's operation, each holding its own place, and one complementing the other."

Under the head of **conservative perineal prostatectomy** Hugh H. Young¹ describes an operation in which he believes he is able to **preserve the ejaculatory ducts**. He has conducted numerous dissections in order to determine the relationship of the ejaculatory ducts to the urethra and the prostatic lobes. His remarks on this subject may be summarized in the following: In the normal prostate the ejaculatory ducts lie for the most part just beneath the posterior capsule, considerably below the level of the vesical neck, and are separated from it by the prespermatie group of glands. In the hypertrophied prostate the same statements are true, the only difference being that the ducts enter relatively lower down, and the vesical neck is separated from them by much more tissue, especially if the prespermatie group of glands have taken on growth with the resulting median lobe enlargement, when the vesical orifice is lifted high up above the level of the ducts. The prostatic tissue immediately adjacent to the ducts is beneath the urethra and plays no part in the obstruction, which is caused entirely by the lateral and median enlargements, both of which are well above the ejaculatory ducts. Young has devised instruments for performing prostatectomy which he states have transformed for him an operation which had previously been done in the dark and with difficulty into one which is now done in plain view and with the greatest precision. Formerly Young employed the inverted Y incision, but he has lately abandoned the vertical portion of this and his incision represents an inverted V. After making the skin-incision the central tendon of the perineum is caught by a clamp near the bulb and divided. This exposes the rectourethralis muscle, which is next divided. Stress is laid upon this step, and Proust has shown that unless the muscle is divided, one operator is apt to tear into the rectum, which is drawn forward by it. Having divided this muscle, a grooved sound is passed into the urethra, which is then opened in its membranous portion sufficiently to allow the passage of the tractor. When the tractor is introduced, it is opened up so that each blade engages a lobe of the prostate. By making traction the gland is brought freely into the wound, and a straight

¹ Jour. Am. Med. Assoc., Oct. 24, 1903.

incision made through the capsule on either side. The intracapsular enucleation is then proceeded with and the delivery of the lobe is facilitated by a special forceps which has been devised for the purpose. The median lobe can also be drawn down by placing the blades of the forceps in a vertical instead of a transverse position, and removed through one of the lateral openings. After removing the prostate Young introduces two tubes which permit a continuous irrigation for some time after the operation. This is done to prevent blocking of the tubes with blood-clot. At the time this paper was read, June 12, 1903, Young had operated upon 15 cases with these instruments, and all the patients were living and well. All could empty the bladder completely and none used the catheter. Incontinence had been only a temporary symptom, and the perineal fistula had closed in all excepting the recent cases. One of these patients, 69 years of age, had lived a catheter life for 10 years. The power of erection has returned in some of his cases, with an apparently normal ejaculation. It was also demonstrated that the semen contained numerous actively motile spermatozoa and the lecithin bodies, which are found in normal prostatic secretion. This is considered proof positive that the ejaculatory ducts with the surrounding bridge of prostatic tissue had been preserved. [Gibbon has employed Young's instruments on two occasions, and finds that Young's claim for them is not exaggerated. They facilitate greatly the delivery of the lateral lobes and render the operation much more accurate.]

Weller Van Hook¹ (Chicago) describes the **technic** which he employs in **performing partial perineal prostatectomy**. He believes that the Bottini operation fills an important place in the therapy of hypertrophy of the prostate. He does not, however, look with favor upon suprapubic prostatectomy. In order to save time and lessen the amount of anesthetic administered, the patient is placed upon the table in the proper position, and every preparation made for the operation. He is then given nitrous oxid followed by ether. The moment the patient is anesthetized, the operation is begun. Following out this plan he has been able to operate upon the majority of his cases in less than 10 minutes, the total duration of administration of the anesthetic being from 13 to 15 minutes. The great advantage of partial prostatectomy is that the operator works well within the capsule of the gland, but is not apt to injure the bladder or rectum, and is also more likely to preserve the seminal vesicles. Brief reports of 13 cases are appended to the article.

Chetwood² (New York) discusses the **choice of technic in operations for prostatic obstruction**, and states that after an experience of 45 years he feels that he is warranted in drawing the following conclusion: "Prostatotomy is less dangerous than prostatectomy; that it is the operation of choice in a large number of cases of prostatic obstruction, notably those of moderate glandular enlargement, orificial hypertrophy, and contracture, in which the prime object is removal of

¹ N. Y. Med. Jour., July 4, 1904.

² Med. News, Aug. 8, 1903.

the obstruction and depression of the bladder orifice: that galvano-caustic incisions, when combined with perineal cystotomy, accomplish satisfactorily the desired result, shorten the operation, and minimize its dangers."

L. Rydygier¹ states that he was the first to introduce **partial perineal prostatectomy**. The method described by him consists in an intracapsular excochleation of the gland. He criticizes the operators who make the incision into the capsule in the median line, as he states the urethra in this way is apt to be injured, and he claims that this tube should not be opened. He asserts that total intracapsular prostatectomy is impossible, but states that it is also unnecessary, as good functional results can be obtained from removal of the obstructing portions of the gland. He points out that in partial removal of the enlarged gland it is possible to save the ejaculatory ducts.

A report of **25 perineal prostatectomies** is presented by Rafin.² In 3 of these operations the rectum was accidentally injured, but closed successfully. Epididymitis occurred in 9 cases. Two patients died as a result of the operation. Both of these patients were well advanced in years and the condition of the bladder was very bad. In most cases there was a general improvement following the operation, this improvement not only continuing, but even increasing as the time passed. In 9 cases the residual urine entirely disappeared, and in all but one it was more or less diminished in amount. Micturition was rendered easier, but the frequency was very little diminished; nocturnal urination did not completely disappear in any case. Retention of urine did not recur in any of the patients.

P. J. Freyer³ presents a further series of 32 cases of **total extirpation of the prostate for the radical cure of enlargement of that organ**. Freyer has already reported 21 cases, and closes his article with a discussion of the combined series. He presents brief reports of the new cases, and his article is extensively illustrated with cuts representing the specimens. The last two cases of the present series are not included in the discussion, as they are still under treatment. The following is his summary of his results: "We have 51 completed instances of this operation, the patients varying in age from 57 to 81 years, the average being 68; and the prostates weighing from $\frac{3}{4}$ ounce to 10 $\frac{1}{4}$ ounces, with an average weight of 3 $\frac{1}{2}$ ounces. The vast majority of them had entered on complete catheter life for periods varying up to 24 years. All were in broken health, and many of them apparently moribund before the operation. Very few of them were free from one or more grave complications, such as cystitis, pyelitis, kidney disease, diabetes, heart disease, thoracic aneurysm, chronic bronchitis, asthma, single or double hernia, etc. Of these, 46 have been successful both immediately and remotely. And when I speak of success, I mean an absolute and complete success, the patients regaining the power of retaining and passing urine without the aid of an instrument as well as they ever did. In no instance has there

¹ *Zent. f. Chir.*, 1904, No. 1.

² *Lyon méd.*, Apr. 3, 1904.

³ *Brit. Med. Jour.*, Oct. 17, 1903.

been a relapse—on the contrary, time seems only to consolidate their cures. In no case has there been contraction at the seat of operation leading to stricture. In no case has a permanent fistula remained. There has been no dangerous hemorrhage during or after the operation. And, strangest of all, there has been no case of septicemia among them—a remarkable fact, considering that in nearly all the cases the bladder was septic before the operation. To what are we to attribute this absence of septicemia? No matter how much we irrigate the bladder, it is impossible to keep the wounds in a state of thorough asepticity. It must be remembered that a very considerable proportion of aged men succumb to septicemia on entering on catheter life. I would suggest that those that survive became more or less immune by a gradual absorption of toxins from the septic urine that prevails sooner or later in all cases of catheter life. There were 5 deaths among these 51 cases, namely: 2 from mania after the wound had practically healed and urine was being passed naturally; 1 from heat-stroke on the ninth day when he was quite convalescent; 1 from coma, due to retention of morbid products of the urine which had set in before the operation; and 1 from pneumonia 7 days after the operation. Though these deaths are recorded in connection with the operation, in only one instance can the fatal result be possibly attributed thereto. In my last 19 completed cases there has been no mishap of any kind." Freyer¹ also presents reports of 20 additional cases in a clinical lecture, bringing his total number up to 73 cases.

Edward Deanesly² discusses the **relative advantages of suprapubic and perineal prostatectomy**. He favors the latter operation for the following reasons: It is anatomically more direct; it does not inflict a double wound in the bladder, and does not open the prevesical cellular tissue. Again, the whole operation can be performed deliberately, and under the direct guidance of sight as well as touch; it permits, therefore, the operator to remove as much or as little of the prostatic overgrowth as the circumstances of the case or the nature of the enlargement render desirable or feasible. Lastly, the drainage of the bladder and subsequent wound treatment are much facilitated by the dependent opening. The operation preferred by Deanesly is that of Proust. He lays particular stress upon the importance of recognizing and dividing the muscular tissue which passes from the extremity of the bulb to the anus. Its recognition is the most important step in the operation, because it is the key to the rectovesical space. It should be divided transversely, and when this is done, it at once opens up the rectovesical space.

B. G. A. Moynihan³ (Leeds) discusses the **removal of the prostate with the prostatic urethra by the suprapubic method**, and presents a list of 12 cases upon which he has operated. In his first case he did not intend to remove the urethra with the gland, but the whole gland became separated from its surroundings so readily that it, together with the urethra, was removed quite unexpectedly. The patient, after the operation, progressed remarkably well, and within 5 weeks the suprapubic wound

¹ Brit. Med. Jour., May 21, 1904.

² Brit. Med. Jour., May 21, 1904.

³ Ann. of Surg., Jan., 1904.

was completely healed and the patient was able to pass his urine in a perfectly natural manner. Since the operation, which was done in September, 1901, there has not been any incontinence, undue frequency, nor any disability. The result in this case caused Moynihan to practise the same procedure in 11 other patients, 2 of them medical men. The ages of these patients varied from 56 to 73 years. In 4 of them a stone was found, and upon one of these patients the suprapubic operation had been performed for stone 14 years previous. After distending the bladder it is opened above the pubes and the left forefinger introduced. The bladder-wall at the incision is then sutured with silkworm-gut to the abdominal wall on both sides. This prevents any undue tearing or stripping of the bladder in the subsequent manipulation. The sutures are allowed to remain for 3 days and are then removed. With the left forefinger in the bladder a snip is then made with a pair of sharp-pointed scissors in the mucous membrane of the trigone, immediately behind the internal meatus of the urethra. This opening is deepened and enlarged by the finger until the mucous membrane is felt to be loosened. Two fingers of the right hand upon which a glove is worn are then passed into the rectum, and between these and the thumb pressed into the peritoneum the prostate is firmly held, while with the left forefinger the stripping of the prostate is commenced. The surface of the lobes is rapidly cleared; the opening in the mucous membrane is torn larger until it completely encircles the internal meatus; and, finally, the anterior portion of the prostatic urethra at its juncture with the membranous portion is torn through after the prostate is elsewhere entirely free. The larger the prostate, the easier the enucleation. When the prostate is free, the fingers of the right hand are removed from the rectum, the glove is taken off, and the prostate is removed from the bladder with vulsellum forceps. As a rule, there is little bleeding, but in 2 of the cases reported the hemorrhage was free from 20 to 30 minutes. A catheter is then introduced, and the bladder freely flushed with hot salt-solution or a 1 % solution of carbolic acid. When the fluid returns almost clear, a large rubber tube is passed into the bladder and a couple of stitches introduced into the wound. The space from which the prostate is removed rapidly contracts. After operation there are usually extreme severe paroxysmal pains which require opium. At the end of 48 hours the tube is removed from the bladder and the patient is allowed to sit up with a bed-rest. On the fourth day and on each succeeding day the bladder is freely irrigated through a catheter passed through the urethra. On the seventh day the catheter is tied in and a drag is placed upon the suprapubic wound. Every day the drag is removed and the bladder again flushed. The catheter is not removed for 5 or 6 days and a new one is then introduced. At each flushing of the bladder a few small sloughs can be picked away with dissecting forceps from the suprapubic wound. If the patient is a feeble old man, he should be allowed to get up and sit in a chair before the end of the first week. The urine ceases to come through the wound about the end of the third week, and at the end of the fourth or fifth the patient is

passing urine spontaneously, at natural intervals, without discomfort or difficulty and the wound is entirely closed. Although McGill and Atkinson, of Leeds, are responsible for the introduction of suprapubic prostatectomy, its revival is due to Freyer, who claims that he is able to enucleate the whole of the prostate and leave the urethra intact. In 2 cases in which the cystitis was excessively severe and the urine most foul, after the bladder had been washed out a stream of oxygen was passed through the catheter and the bladder, as it were, washed out with oxygen. Over the suprapubic wound a tight-fitting impervious cap was placed having a small leak to allow of the escape of the gas. In this way the healing of the wounds was certainly hastened. Because of the class of patients suffering from enlargement of the prostate the operation must always be a serious one, and Moynihan thinks it is an important thing, especially in the older patients, to allow them to get out of bed 2 or 3 days after the operation.



Fig. 35.—Lydston's prostatic tractor.

The accompanying illustration (Fig. 35) represents a **prostatic tractor for perineal prostatectomy** which has been devised by Lydston.¹ The tractor is introduced through an opening in the urethra, and after its introduction, is turned with the finger through the perineal wound in such a way as thoroughly to grasp the prostate, which can then be brought down by traction.

A new method for performing perineal section without a guide is described by C. L. Gibson.² This operation is indicated in those cases of stricture of the deep urethra which are impermeable to any guide. Experienced surgeons are able to perform external urethrotomy without a guide with little difficulty where there is no urinary extravasation. A limited number of cases, however, do present obstacles which

may render the operation extremely difficult. Gibson discovered, by repeated trial upon the cadaver, that by exercising sharp traction on the prostate the deep urethra is made taut to a degree which renders its recognition unmistakable. The traction on the prostate is exerted downward and somewhat backward. The technic of the operation is described as follows: "Lithotomy position. Thorough preliminary irrigation and cleansing of the rectum. A suitable speculum, preferably Kelly's, is introduced, and the prostate is *transfixed* laterally from the rectum, preferably by a large, sharp hook, which is driven firmly through the prostate tissue. The speculum is now withdrawn, leaving the hook *in situ*. Median perineal section is then performed, the incision being extended down to the ordinary depth of the situation of the urethra. The left forefinger is now introduced into the wound. As the assistant executes a series of gentle tugs on the hook, one readily receives the sensa-

¹ Ann. of Surg., Sept., 1903.

² Ann. of Surg., Oct., 1903.

tion of the intermittent tension of the urethra in response to the traction on the prostate. Keeping the forefinger in place, the surgeon directs his bistoury into that portion of the deep urethra which is thus rendered prominent; the probe-pointed director readily glides alongside the knife into the lumen of the urethra, and following it the small metal catheter will demonstrate the successful access to the bladder. The performance of these various steps requires only a minute or two." Within the past 2 years Gibson has performed this operation more than 20 times in both simple and complicated cases, with uniform success. He does not find that slender vulsella or tenaculums are suitable instruments for making traction—a larger and stouter hook is required. The one objection which can be raised to this operation is the danger of infecting the prostate. Gibson thinks, however, that this danger is remote, and in none of his cases have any bad results followed. This possible drawback, however, to the operation prevents him recommending its routine or indiscriminate employment. This method should be reserved for cases attended with unusual difficulty.

Moore¹ (Minneapolis) presents a paper dealing with the **complications and sequels of prostatectomy**. Notwithstanding the enthusiasm of certain operators, the operation of prostatectomy must be looked upon as a grave one and applicable only to properly selected cases. Age alone can be taken as no proper index to the advisability of operation. As long as a man's heart, arteries, and kidneys are in fit condition to permit the administration of an anesthetic he is a fit subject for surgery. The most frequent cause of death after operation is uræmia, and therefore serious kidney involvement is a contraindication. The modern practice of administering water and urotropin freely for a few days preceding and following operation undoubtedly carries some patients from the borderland to the safe side. The next greatest danger is sepsis, and in the presence of an infected bladder it is an ever-present one. The complicating cystitis is often the most positive indication for operation, since the only satisfactory treatment for this condition is drainage, and this is best brought about by perineal prostatectomy. A frequent complication of prostatic hypertrophy is stone, and it should always be sought for and removed when found. A too extensive incision, either suprapubic or perineal, is accompanied by certain dangers, such as hemorrhage and the injury of the peritoneum or important muscular structures. Hemorrhage is an overestimated complication. The median perineal incision certainly reduces this danger to the minimum. It is thought that too little effort has been made to protect the urethra in the perineal operation. The removal of the prostatic urethra simplifies the operation, but Moore believes that it will result later in traumatic stricture of the urethra, which may be a worse condition than enlargement of the prostate. The most difficult problem in the perineal operation is to avoid injury to the rectum. In young men especially we should endeavor to develop a technique which will preserve the seminal ducts. It is suggested that interference with blood- and nerve-supply

¹ Ann. of Surg., Mar., 1904.

by a too liberal perineal incision may be a cause of impotence. Incontinence or dribbling after prostatectomy is due either to injury of muscles or nerves or to the neck of the bladder—most frequently the latter. It should rarely occur, because, by proper care and conservatism, it can be avoided. The perineal fistula usually results from prolonged drainage. To avoid it it is suggested that the cavity occupied by the prostate should be obliterated by the introduction of catgut sutures and the removal of the drainage-tube before the end of a week. It is a mistake to fill a large space in the perineum with gauze, because it delays union and leads to complications and sequels. Rectourethral fistula is a sequel occasionally met, and epididymitis is quite a common sequel of prostatectomy.

Edward L. Keyes¹ discusses at considerable length the question **does gonorrhea cause prostatic hypertrophy?** The following is a summary of his remarks: 1. Among 433 cases suffering from prostatic hypertrophy, only 18 show clinical evidence of previous prostatitis. 2. These 18 present no marked difference in point of size of the prostate or of beginning of the disease to differentiate them from the remaining 415. 3. Comparison of these 18 cases with 54 cases of chronic prostatitis without hypertrophy shows that the proportion of such cases suffering from prostatic hypertrophy varies little from the normal. 4. Prostatitis lasting more than 10 years probably tends to produce prostatic atrophy rather than prostatic hypertrophy. 5. Therefore if it is true that hypertrophy of the prostate is pathologically referable to inflammation, the clinical data suggest that this inflammation is either early gonorrhea of relatively brief duration or some obscure sclerotic process associated with advancing years. 6. The late date at which prostatic hypertrophy begins, and its infrequency, compared with that of early gonorrhea, make it seem clinically most improbable that early gonorrhea is the cause.

Lydston² (Chicago) reports a case of **enormous prostatic calculus** removed from a man 34 years of age. The calculus-formation followed a traumatic stricture of the perineal urethra. Suppuration occurred about the stone, and there developed a secondary abscess in the pelvis. The stone was removed through the perineum by another operator, and there subsequently developed an extensive urethrorectal fistula requiring an extensive plastic operation for its closure. This was done by Lydston, and the result was most satisfactory, the opening into both the urethra and the rectum closing completely. The opening into the rectum in this case was remarkably large—approximately 2 inches in length and $\frac{1}{2}$ inch in width. Feces passed through the urethra, and urine and feces both passed through the perineal fistula.

A. L. Chute³ (Boston) reports a case of **hemospermia**. The ejaculation of blood-stained semen is an uncommon condition, and should be looked upon as a symptom and not a disease. The most frequent causes of a transient hemospermia are excessive coitus, a lesion of the

¹ Jour. Am. Med. Assoc., July 16, 1904.

² Ann. of Surg., Mar., 1904.

³ Med. Rec., Nov. 7, 1903.

prostatic urethra, and perhaps rarely an acute seminal vesiculitis. The persistent type of the condition is usually due to a chronic prostatitis, less frequently a seminal vesiculitis, and rarely cancer or hypertrophy of the gland. The condition is a painless one. Care should be taken, by thorough examination with the endoscope, to differentiate a chronic prostatitis from a seminal vesiculitis. The prospect of ultimate recovery is very good. Massage is the most important factor in the treatment, but should be combined with hot rectal injections.

Reginald Harrison¹ presents some remarks on **cancer of the prostate and the selection of cases for suprapubic prostatectomy**. He believes that cancer of the prostate is more frequent than is generally supposed, and in order to avoid the mistake of performing prostatectomy for cancer, it is necessary that the symptoms of this condition should be known. It occurs in younger persons than does the ordinary form of prostatic hypertrophy. The condition is usually associated with considerable lumbar and sciatic pain. Later the chain of glands in the groin become involved. Rectal examination reveals a gland of stony hardness and of marked fixidity. Vesical hemorrhages occur occasionally, but serious alterations in the character of the urine and obstruction to catheterization are often delayed. The disease appears to prove fatal by the general decay rather than by any interference with the function of micturition. Great stress is laid upon the necessity of making a cystoscopic examination in all cases where operation for disease of the prostate is contemplated. In cancer there is not very much intravesical projection of the prostate, and what there is, is of an uneven and irregular outline, contrasting with the smooth, rounded appearance of the hypertrophied gland. Prostatectomy is not to be recommended for this condition, and Harrison states that in 2 cases he is now employing the röntgen rays and Finsen light, with relief of symptoms. He does not undertake to say what the ultimate result will be in these cases. Particular attention is called to the necessity of determining the character of hypertrophy of the prostate which is present before undertaking any remedial operation, since in many instances a simple operation may be performed with perfect success, thus avoiding the more dangerous total extirpation of the gland.

Primary carcinoma of the prostate is discussed in full by Hawley² (Seattle), whose conclusions are as follows: "1. This disease is sufficiently common and so frequently unrecognized—mistaken for simple enlargement—as to actuate more intelligent and accurate clinical observation upon all elderly men. Exclusion of cancer and watchfulness of its development in all cases of hypertrophy are indicated. The doctrine that 'prostatic hypertrophy is at all times easy of diagnosis' should be modified. 2. Cancer of the prostate is most distinctly operable before metastasis has taken place to regional or remote organs, and is distinctly inoperable after secondary vesical, glandular, and skeletal invasion. The high percentage of operative cures reported from the French clinics presages a promising future. 3. Radical operation should

¹ Brit. Med. Jour., July 4, 1903.

² Ann. of Surg., June, 1904.

prescribe liberal perineal exposure of the prostate, with preliminary exploration of the bladder and periprostic structures, and total intracapsular enucleation—urethrostomy. Prostatectomy *per se* is procrustean. 4. There is opportunity for further pathologic investigation,—particularly the careful postmortem examination of all senile prostates,—for systematic clinical observation, and for operative improvement. It will be interesting to become better acquainted with the actual frequency of prostatic cancer, with the possibilities of early diagnosis, with the osseous phenomena and blood-changes, and with the possibilities of surgery as a radical curative measure."

Cancer of the prostate is dealt with in a paper by Robert Holmes Greene,¹ who has gone thoroughly over the literature of this subject with the idea of formulating the symptoms and treatment of this condition. He also reports a case of his own. Cancer of the prostate was probably first recognized by Langstaff in 1817. It is only during recent years, however, that the differentiation has been made between cancer and sarcoma of the prostate. From a study of the literature Greene is led to believe that cancer occurs in a proportion as high as from 5% to 10% of old men suffering from prostatic disease. Glandular metastasis is frequent and rapid. The average age of the patients in 19 cases which have been reported is 68 years. Pain is considered an unvarying accompaniment of cancer of the prostate. It is often referred to the perineal region, to the rectum, to the back, and to the sciatic region; it may also be referred to the glans penis. It may be the first symptom to suggest malignancy, and when it occurs in a patient suffering with any prostatic trouble, it should be looked upon as very significant. Hematuria is of common occurrence, but its origin should be accurately located by means of the cystoscope. A cancerous prostate may feel hard, nodular, or even soft. The condition usually develops in the lateral lobes. The prognosis is extremely grave. The treatment is divided into preventive, palliative, and curative. The preventive treatment consists in the eradication of such inflammatory conditions as are apt to lead up to cancer, such as chronic posterior urethritis and chronic prostatitis. Palliative operations, such as drainage, are justifiable, but should not be attempted if the operation decided upon is of a character to make the after-character of the disease more distressing to the patient. The only curative measure is total prostatectomy before metastasis has taken place. The case reported by Greene is that of a man, 59 years of age, in whom a prostatectomy was done for hypertrophy of the gland. Examination showed one lobe, however, to be malignant. Greene's article is illustrated by a microphotograph of a section through each lobe. Excepting for a small fecal fistula, the result of a rectal injury during the operation, the patient has been in good health and is without return of the trouble one year after the operation.

¹ N. Y. Med. Jour., Oct. 24, 1903.

PLASTIC SURGERY, BURNS, ULCERS, AND GUNSHOT WOUNDS.

Frederic Griffith¹ describes a case of what he calls **lip-tie**, occurring in an Italian infant. Since birth the inner surface along the middle line of the entire upper lip has been bound to the gum by a fold of tissue continuous with the mucous membrane of the mouth, and about $\frac{1}{2}$ of an inch in thickness. The teeth were normal, and there was no unusual interval between the central incisors. When the mouth was opened, the middle of the upper lip rolled directly inward. The condition is called lip-tie because of its resemblance to a corresponding condition occurring in the tongue.

Truman W. Brophy² deals with the **time of life most favorable for operations upon congenital clefts of the palate**. After an extensive experience he believes that the best time for this operation is within the first 5 months of life, preferably within 3 months. He states that some of his best results have been obtained in infants operated upon when from 10 days to 3 weeks of age. Where the premaxillary bone protrudes, it should not be removed, but should be carried back into its normal position. It is stated that before the bones are fully calcified they may be bent and moved without fracture, and therefore there is less traumatism in the early operations. The cleft in the palate should always be repaired before that in the lip.

Edmund Owen³ reports a case of **cleft palate and harelip** upon which he **operated after the manner of Brophy**. Owen states that for many years it was his custom, as it is that of many surgeons, to operate first upon the cleft in the lip and later upon the palate. Recently, however, he had been convinced that the operation of Brophy is to be preferred to this practice, and has employed it very successfully. The case reported is that of an infant, 3 months of age, weighing 6 $\frac{1}{2}$ pounds and in a very bad condition. The clefts in both the lip and palate were complete and very wide. When the child was anesthetized, it was found impossible with the hands, although considerable force was used, to approximate the bones, and therefore two openings were made above the alveolus on either side and silver wire introduced. A plate was then placed against the alveolus on the outer side, to prevent cutting by the wire, and the two wires from each side were then twisted together. It was found that even by this means the bones could not be approximated. Therefore, as suggested by Brophy, the mucous membrane was divided over each malar process and the lower portion of the bone separated with a scalpel. Approximation was then found easy, and the edges of the cleft were sutured. Three subsequent small operations were necessary in order to complete the cure, but the ultimate result was most satisfactory. When the method of Brophy is followed, it is unnecessary to make lateral incisions for the approximation of the soft palate, a procedure which Owen suggests may be re-

¹ Ann. of Surg., Mar., 1904.

² Brooklyn Med. Jour., Sept., 1903.

³ Lancet, Dec. 19, 1903.

sponsible for the want of improvement in the voice which is often noticed after a perfectly successful approximation of the edges of the cleft.

A. W. Murray¹ (Liverpool) deals with the **age for operating in cleft palate**. He states that if the cleft involves the bones of the hard palate, articulation will never be perfect, even though the child has been operated upon early in life and the operation successfully performed. When there is a cleft of both palate and lip, Murray operates upon the lip when the child is 3 or 4 weeks old, and upon the palate, either soft or hard, as the case may be, at the end of the second year. The primary closure of the lip greatly facilitates the closure of the palate, the space becoming narrower as the child develops.

In a lengthy article on the **subcutaneous injection of paraffin for the correction of deformities of the nose** F. Gregory Connell² thoroughly discusses the subject and reports 6 cases successfully operated upon. His article is accompanied by numerous illustrations, and his conclusions are as follows: "1. Corning was the first to use solidifying oils in surgery. 2. Gersuny was the first to recommend and to use paraffin subcutaneously as a prosthetic measure. 3. The use of paraffin as a prosthetic substance is still in an experimental stage. 4. The field of usefulness of paraffin subcutaneously in other than nasal deformities is rapidly increasing. 5. Prosthetic operations, undertaken solely for cosmetic effect, should be absolutely harmless. 6. All cases, regardless of the termination, should be reported, as it is only by a study of a large number of cases that the legitimate place of this method in surgery can be ascertained. 7. The special syringe, with screw pressure, is almost indispensable. 8. A general anesthetic is rarely, if ever, indicated. 9. The needle may be made to enter at either the base or the tip of the nose. 10. Rather inject too little than too large an amount of paraffin. 11. In a series of 6 cases but one of the numerous objections was encountered, and that a redness of the skin remaining permanently after the injection."

A. W. Morton³ (San Francisco) discusses the **injection of paraffin for the correction of deformities** and reports 23 cases. He uses paraffin at a melting-point of 109° F., the melting-point being brought to this degree by adding sperm oil. It is sterilized by placing it in a water-bath and exposing it to a heat sufficient to boil the paraffin. Luxe's glass syringe, holding 8 cc. and readily sterilized, is used for the injections. Morton states that he has never found it necessary to use either local or general anesthesia in this operation. The paraffin is injected just as it begins to coagulate, and the parts are molded as the paraffin is injected. A number of photomicrographs of tissue injected with paraffin after varying periods are presented. At the end of a month the globules of paraffin are found surrounded by a capsule of embryonic tissue. The sections tend to show conclusively that the paraffin soon disappears.

Fritz König⁴ describes an **operation for the cure of congenital**

¹ Brit. Med. Jour., Aug. 29, 1903.

² Jour. Am. Med. Assoc., Sept. 19, 26, 1903.

³ Amer. Med., Oct. 24, 1903.

⁴ Arch. f. klin. Chir., Bd. lxx, p. 1008.

fistulas of the neck. The fistula is first carefully separated from all its surroundings—from the skin up to a point close to the opening in the pharynx. The mouth is then opened with a speculum, and a curved probe passed through the wound until it pushes the mucous membrane forward at a point anterior and inferior but close to the tonsil. The mucous membrane is then incised, and the probe drawn into the mouth. The fistulous tract which has been freed is then tied to the probe by a silk ligature, and drawn through the opening into the mouth and fixed in this position by sutures. The protruding portion of the fistulous tract is then cut off, and the external wound closed. The result of this is that instead of having a fistula opening in the skin of the neck, there is a short, harmless fistula with one opening behind and the other in front of the tonsil. This operation is much simpler than that of complete excision of the fistula and is perfectly successful. The most difficult part of the complete excision is the removal of the pharyngeal end of the fistula. This is avoided in the operation here described.

W. Scott Schley¹ is a strong advocate of the use of rubber tissue and boric acid in the treatment of surface granulating wounds, and especially varicose ulcers of the leg. On these granulating surface wounds thoroughly powdered boric acid is sprinkled; the rubber tissue is then smoothly applied, so as to overlap the edges of the ulcer an inch or two. It is prevented from slipping by the use of adhesive strips. An abundant gauze dressing is then applied with a firm bandage. It is said that it is rarely necessary to change the dressing oftener than once every 5 days. Under this dressing epithelial growth is very rapid. When the dressing is first changed, little improvement will be apparent, as the surface is generally moist and red and the granulations seem uncovered with epithelium. It is said, however, that it is wise to refrain from touching this surface, and in a few minutes, when it is dried by exposure to the atmosphere, a marked differentiation of the parts covered and uncovered by the epithelium will appear, the covered parts appearing dry, smooth, and slightly glazed, while the uncovered are relatively moist and red, like granulation tissue.

Robert W. Johnson² (Baltimore) reports 5 cases of laparotomy for gunshot wounds of the abdominal viscera. These cases were all operated upon within a period of 5 months. The first was one of gunshot wound of the stomach and liver. A 32-caliber bullet made a rent of 2 inches in the greater curvature of the stomach and then passed through the liver. The patient was operated upon immediately on her admission to the hospital, one hour after the accident. The wound in the stomach was closed with Lembert sutures, and the liver wound, which was bleeding freely, was closed with catgut sutures. The abdomen was closed without drainage, and the patient made an uninterrupted recovery. The bullet gave no further trouble, and its location was not determined. The second case was one of gunshot wound of the liver, which was operated upon 27 hours after the injury, the patient

¹ Med. Rec., June 4, 1904.

² N. Y. Med. Jour., Mar. 26, 1904.

at this time showing signs of peritonitis. The bullet was lodged in the thoracic wall. The abdomen was opened in the median line, and a perforating wound of the liver was found, but not disturbed, as bleeding had ceased. There was considerable blood in the abdominal cavity, which was flushed out with salt-solution. This patient also recovered satisfactorily from the operation, but 12 days later developed an abscess of the lung which evacuated itself through the bronchi. He made a good recovery and was discharged cured on the thirty-sixth day. The third case was also one of gunshot wound of the liver. The patient was in a bad condition 24 hours after the injury, temperature 102.4°, pulse 140, and respiration 40. The bullet, one of 38 caliber, had entered between the ninth and tenth ribs anteriorly on the right side. The abdomen was opened along the border of the ribs, and a furrowed wound of the liver found. The bullet was located between the liver and diaphragm and removed. The abdominal cavity contained a quantity of blood which was thoroughly washed out with salt-solution. The abdomen was closed without drainage and the patient made an uninterrupted recovery. The fourth case was one in which the intestine had been injured, but not perforated, by a 32-caliber ball. He was in good condition at the time of operation, and the abdomen was opened in the median line. The injured portion of the bowel was inverted with Lembert sutures, and a small gauze drain introduced. This patient also made a good recovery. The fifth case was one in which 17 perforations of the small intestine and 11 of the mesentery were found and sutured. There was an enormous quantity of fecal matter in the abdominal cavity, which required gallons of salt-solution to remove thoroughly. This patient made a good recovery and was discharged on the twenty-first day.

John A. Wyeth¹ reports an interesting case of **gunshot wound of the brain**. The patient was a man, 23 years of age, who was shot with a 32-caliber pistol, the bullet entering the skull through the frontal bone, at a point about an inch to the right of the median line and about an inch from the junction of the interparietal and frontoparietal sutures. There was no wound of exit. The wound was dressed antiseptically, but no attempt made to locate the bullet. The patient suffered nearly immediate impairment of the mind, but he was never at any time entirely unconscious. During the first 2 months at times he was delirious. There was never any paralysis or other evidence of injury to the motor area. Wyeth first saw the patient 5 months after the injury. At this time the only evidence of injury to the brain was seriously impaired intelligence. The patient talked incoherently, was restless, and had to be constantly watched. The bullet was located by the röntgen rays in the anterior lobe, just above the orbital roof. The wound had never closed, and through it, after the patient was anesthetized, the bullet was distinctly felt with a Nélaton probe at a depth of about 3 inches. The finger was then introduced and the bullet removed with forceps. An opening was next made in the skull just above the eyebrow, the

¹ Amer. Med., Feb. 13, 1904.

dura opened, and a drainage-tube introduced into the abscess cavity. This was done for the purpose of getting thorough drainage. A tube was also placed in the upper wound. The patient made an uninterrupted recovery excepting for an immediate rise of temperature after the operation. The delirium disappeared after 3 weeks and he became rational. Two months after the injury he returned to his home in West Virginia alone. He made a complete recovery except for a very slightly diminished intelligence. He was able to resume his avocation. Other cases of penetrating wound of the brain are referred to and discussed.

Alexander B. Johnson¹ presents a study of the **effects produced on the skin by the discharge of small arms loaded with smokeless powder**, and reaches the following conclusions: 1. Powder-marks upon the skin and clothing produced by smokeless powder are much less distinct and definite than those caused by black powder. 2. With the weapons used in these experiments such marks cease to be produced when the distance exceeds one foot and the shot is fired at the naked skin. 3. At a distance of 3 inches or less powder-marks may be present, but they will always be faint, and may in many instances be wiped away from the skin with a wet or dry cloth. 4. If the shot is fired at a part of the body covered with clothing, no powder-marks at all will be found upon the skin. The clothing will never be scorched, no matter how near the weapon is held. If the clothing is wool, no powder-mark is likely to be detected upon it even at the closest range, unless under the microscope. If the clothing is of linen, a faint mark may be found upon it if the weapon were held at a distance of 3 or 4 inches or less. If the distance much exceeded this, no mark would be produced. The evidence furnished by a microscopic examination of the pieces of linen appears quite interesting. It is evident that by this means it might in certain instances be possible to state with some positiveness that a certain kind of ammunition had or had not been used. [For further literature on gunshot wounds see sections on viscera.]

RÖNTGEN RAYS AND RADIUM.

The Journal of the American Medical Association,² in discussing the **surgical uses of radium**, refers to a review of the subject by Abbe.³ Metallic radium has not been isolated, and the product on the market is known as the chlorid of barium and radium. The strength of the specimen is estimated by the rapidity with which the salt discharges a gold-leaf electroscope. The standard unit of time adopted is that required for the discharge of such an electroscope by metallic uranium. If the specimen of radium discharges the instrument in one-thousandth the time required by the uranium, the strength is taken as 1000. Specimens of high strength are generally used—anywhere from 200,000 to 300,000. The use of radium to give pictures of dense substances, as the röntgen rays are used, is not likely to prove very satisfactory, for

¹ Ann. of Surg., May, 1904.

³ Mar. 26, 1904.

² Washington Med. Ann., 1904, vol. ii, p. 363.

it gives no sharp definition. Radium rays inhibit the growth of certain bacteria, such as *Bacillus anthracis*, *Bacillus typhosus*, and *Bacillus coli communis*. Radium is not without harmful effects, so while it inhibits the growth of bacteria, the rays damage the tissues to so great an extent that they will probably prove of little therapeutic value. Radium burns resemble those from the röntgen rays, appearing several weeks after exposure as a slight reddening, which in cases of longer exposure may go on to form a blister or even a large ulcer. The scar is likewise smooth and hairless, even though the deeper parts of the skin are not involved, and healing is as slow as in röntgen-ray burns. The therapeutic uses of radium follow the same lines as those of the Finsen and röntgen rays. A number of cases of lupus treated successfully with radium have been reported. In some of these one part of the disease was treated with Finsen light and the other with radium, with the results in favor of the radium. Psoriasis and telangiectasis have also been treated successfully. One case of general melanosa of the skin is reported by Exner, in which the smaller nodules disappeared and the larger ones were growing smaller at the time of report. A large number of cases of inoperable carcinoma have been treated with radium, some of them with considerable success. Radium should be classed with the röntgen ray, Coley's serum, Adamkiewicz's serum, and the various caustics. These have given cures in a few cases, but are so uncertain in their action that they should not be used except when operation is out of the question.

S. G. Tracy,¹ in discussing the **therapeutic possibilities of thorium**, says the elements which have radioactivity are radium, thorium, polonium, and actinium. Thorium has been used in the Welsbach mantle to produce incandescence. The oxid of thorium will act on a photographic plate through several thicknesses of paper after 1 or 2 days. If heated, this action is much enhanced. Soddy is investigating the value of thorium in tuberculosis, and an apparatus has been devised by Lieber for the inhalation of thorium emanations. Thorium possesses antiseptic qualities.

C. L. Leonard,² in a paper on **röntgen diagnosis and therapeutics**, says the application of this method has been facilitated by the recent production of efficient portable induction-coils, so that the method can be used at the patient's bedside. The accuracy of the röntgen ray in the diagnosis of renal calculus has been shown in 305 cases. Calculi have been found in 89, and 60 % of these calculi have been found in the ureter. The negative diagnosis has proved more accurate than the positive. Errors have been made in 9 cases, or less than 3 %. In only 1 of the 45 cases of negative diagnosis that were subsequently operated on was a calculus found. In 2 others small calculi were afterward passed. This method is free from all the dangers that accompany exploratory operation and catheterizations. It is most accurate and comprehensive, without occasioning pain, injury, or even inconvenience to the patient. The exact number and situation of all calculi are

¹ Med. Rec., Jan. 23, 1904.

² Brooklyn Med. Jour., Jan., 1904.

accurately determined, so that no calculi are left behind at operation. The danger of operating upon the wrong kidney is entirely avoided, and the field of operation is limited to the exact position of the calculus, thus decreasing the operative trauma. In malignant disease the röntgen-ray must be used with all the severity the patient's vitality will permit. Anything short of this stimulates rather than hinders. The full therapeutic action cannot be produced until tolerance is secured in the normal tissue. This is shown externally in a gradually darkening tan, often followed by a dry exfoliation of the epidermis. This method of treatment should be employed in all cases of malignant disease, either post-operatively as a prophylactic, or as a palliative and possibly curative agent in inoperable cases. Leonard also call attention to the value of the röntgen-ray in neuralgia, and mentions a case of partial paralysis of the arm and leg due to scar tissue in the motor area of the brain after an operation for abscess, in which, after 9 treatments through the trephine opening, the patient was able to raise the arm to the level of the shoulder.

Carl Beck¹ describes an **osteoscope for the protection of the operator in röntgen-ray work**. A large experience will enable the physician to guess the degree of the vacuum by the general appearance of the light, but the method is not reliable. The osteoscope devised by Beck, instead of jeopardizing the living extremity of the patient or physician, utilizes dead bone. The bones of the forearm and hand are fastened to a sheet of pasteboard which is inserted in the frame of a fluorescent screen. Just as in the living carpus, the bones appear black if a soft tube, and light gray if a hard tube, is chosen. The handle of the osteoscope is surrounded by a shield of lead, so that the hand is perfectly protected while holding it.

Joseph F. Smith² has investigated the **permeability of rubber drainage-tubing to the röntgen ray**. He found that red rubber-tubing gives a dense shadow; that the plain white and the corrugated white tubing cast a distinct shadow; that the maroon color gives a less distinct shadow, while the pure gum tubing produces scarcely any shadow at all. This variation is explained by the coloring-matter in the tubing. The red rubber contains vermilion (mercuric sulfid); the maroon tubing contains vermilion or antimony sulfid, generally the latter; the white tubing contains salts of lead or zinc, chiefly lead oxid; the pure gum contains no metallic compound. In the drainage of cavities or long sinuses it is advisable to use rubber drainage-tubing which produces a shadow with the röntgen ray, especially when there is danger of the drain being lost in the cavity. For diagnostic purposes red rubber-tubing passed into the esophagus, etc., will show in the skiagraph the extent to which the passage is patulous.

John T. Pitkin³ summarizes the **dangers of the röntgen-ray operator** as follows: More or less loss of integument, with its appendages, hair, hair-follicles, nails, sebaceous and sudorific glands, disfigurement by scars, pits, warts, pigmentation, and skin diseases; chronic scaly

¹ N. Y. Med. Jour., Nov. 28, 1903.

² Med. News, Dec. 19, 1903.

³ Virginia Med. Semi-monthly, Mar. 25, 1904.

skin diseases, because of the destruction of the sweat-glands and oil-glands, horny papillary thickening of the ends of the fingers beneath and around deformed nails, crowding the nails away from their matrices; purpura hemorrhagica and punctate clots in the newly formed skin; erythema, either circumscribed or diffused, or circumscribed anemia; hyperesthesia to all forms of radiant energy and traumatism; anesthesia in circumscribed areas; increased vasomotor activity; small abscesses at the roots of the teeth; temporary decrease of sexual power; erratic or redundant growth of hair; tendency to spasmodic muscular contraction; edema; rheumatoid symptoms; impairment of vision; intellectual derangement; breaking of Crooke's tube and cutting of flesh by the centrifugal flying fragments of glass; carcinoma; infection of abrasions due to röntgen ray. The rays have been accused of causing headache, indigestion, sore-throat, and symptoms like those produced by a mild sunstroke. The following precautions may be adopted: 1. Never allow the use of any portion of your body for others to look through. 2. Never change the adjustment of a tube or position of patient while the apparatus is in operation. 3. Never use the hand in front of the fluoroscope as a röntgen radiometer. 4. Never allow the strong destructive rays in the center of the field to shine upon the person. 5. Wear the safety röntgen-ray gloves invented by Dr. Price, of Cleveland. Silk or rubber gloves lined with foil are better than no protection. 6. Wear glasses as an extra protection for the eyes against the rays and the disruption of tubes. 7. Wear an office coat with extra long sleeves that come well over the backs of the hands, the skirt of coat to cover the hips, the entire garment lined with foil or the Price material. A safety fluoroscope can be made with a hood fitted over the trunk and attached around the margin of the distal extremity—the hood to be large enough to extend over the head, face, and hand of the operator. A rigid flaring metallic plate can be fitted around the middle of the trunk of the fluoroscope on its outside, extending laterally therefrom, and a thick piece of plate glass fitted to the inside of the removable end of that instrument. 8. Do not excite the tube with a sinusoidal current, or, what amounts to the same thing, overload the direct current with spark-gaps and thus change it into the sinusoidal. A tube thus excited scatters rays in nearly every direction. 9. Remain behind the target, the static machine, or thick plate-glass screens having metallic bases, through the glass of which one can observe all that is transpiring, or examine the patient, who holds the fluoroscopic screen, while the physician remains excluded from the röntgen-ray field. 10. If obliged to enter the field for any purpose, remain as far away from the excited tube, and work in the outer confines as much as possible. Do what is required; then return to a position of safety immediately. Another good plan for self-protection is to screen one's self from such pencils of röntgen light as would come your way with a copper plate placed so that you can see the working of the other portions of the tube, or screen the entire tube and observe its reflection in a looking-glass. A combination screen and tube-hokler, to invest the tube on all sides, with a suitable aperture

for the egress of the rays can be made of very thick glass. The new form of clinical adjustable tables, with a copper or sheet-iron covering nailed onto the wooden top, the top turned on end, make admirable impromptu screens for many purposes. The foreign makes of tubes, said to be made of glass which is opaque to the rays except at a limited area, are worthy of trial.

G. Holzknecht and R. Grünfeld¹ recommend as a **protection against the röntgen rays** a sheet of tin covered on each side by rubber. It is flexible, easily manipulated, readily cleansed, and is impermeable to the röntgen rays.

J. A. C. Macewen² proposes a method for the **localization of foreign bodies** embedded in the tissues. Owing to the rapid divergence of the röntgen rays, the shadow of any object not actually in contact with the fluoroscope will change its position in relation to the bones when the screen is moved, and the further the object is from the screen, the greater will be the movement of the shadow. If the shadow of the object rises and falls with the screen, the object is on the tube side of the bones, and when it moves in the opposite direction to that of the screen, it is on the screen side of the bone. When the shadow does not move relatively to the bone, it must be close to or embedded in it.

J. T. Dunn³ reports a case of **sloughing following an operation in a patient who had been subjected to röntgen-ray treatment**. The case was one of carcinoma of the breast, which, after röntgen-ray treatment, was submitted to operation. There was very little bleeding during operation, and 48 hours later a slough the entire length of the incision and about one inch wide was found. Two similar cases have been reported.

C. E. Skinner⁴ reports 2 cases of **röntgen-ray necrosis** following treatment, one for pseudoleukemia and one for abdominal carcinoma. Both patients tanned readily, although it is held that one who tans well need not fear a burn. In one case the skin again broke down after healing 5 months after the last exposure to the röntgen rays. In both cases the healing after the separation of the slough was accelerated by the direct electric current. In both cases new areas of necrosis appeared—in one 5, and in one 6, months after the last röntgen-ray exposure.

George G. Hopkins⁵ presents a paper on the **spectroscopic elements of light as therapeutic agents**. He has modified the Finsen apparatus, so that the tube and light may be adjusted to suit the comfort of the patient. The Finsen light has achieved remarkable results in lupus, erythema, and rodent ulcer. Alopecia areata is successfully treated by the Finsen method, but the surface covered at one exposure is so limited that it has been abandoned in this disease. Angiomas and acne have also been satisfactorily treated by the Finsen light. For epithelioma the Finsen method combined with the röntgen ray has no equal. As the result of his experience with the röntgen ray in carcinoma

¹ Münch. med. Woch., July 5, 1903.

² Brit. Med. Jour., Aug. 5, 1903.

³ Internat. Jour. of Surg., Aug., 1903.

⁴ Med. News, Feb. 20, 1904.

⁵ Amer. Med., Nov. 28, 1903.

of the breast Hopkins states that this disease is absolutely curable in its earlier stages. In epithelioma of the lower lip the results obtained with the röntgen ray leave nothing to be desired. Eczema, nevus, psoriasis, acne, hypertrichosis, alopecia areata, sycosis, and lichen have been cured by the röntgen-ray. The Minim light is of great value in the treatment of ulcers of various sorts and acute injuries. For the treatment of pulmonary tuberculosis Hopkins has arranged a 50-ampère searchlight so as to change the focal point to a distance of about 12 feet. This light is passed through blue glass to filter out some of the heat-rays. This method of treatment will cure pulmonary tuberculosis in the first stage and many in the second stage. The German light-bath is of value in malnutrition, neurotic affections, anemia, dyspepsia, and all forms of debility. It is suggested that radium in a small glass tube be inserted in the center of a carcinomatous mass in order that the emanations affect the growth itself without endangering the surrounding tissues.

W. J. Martin¹ seeks to induce **artificial fluorescence of living human tissue** by giving 5 to 10 grains of quinin bisulfate about one hour before röntgen-ray treatment. The quinin possesses the property of fluorescence when exposed to the röntgen ray, and it is thought that the feeble fluorescence of a quinin atom lying against the tissue atom would equal a much more powerful radiation from a more distant source.

L. H. Harris² has examined 328 cases of suspected **renal calculus with the röntgen ray**, with 50 positive findings, the findings being corroborated by subsequent operations. The positive results are of more value than the negative. Calculi composed of oxalates give the most distinct shadow; next come the phosphates, and finally the uric-acid calculi. A doubtful shadow appearing on several plates raises a strong suspicion of stone. Most of the 7 mistakes made were in very stout patients.

Joseph F. Smith,³ in a paper on the **röntgen-ray diagnosis of renal calculus**, gives the conclusions of Kummel and Rumpel, who report a series of 18 cases diagnosed positively by the ray; 1. The exact diagnosis of kidney-stone is to be made only by means of the röntgen procedure. 2. The presence of a kidney-stone, whether located in the kidney-substance, the calices, or in the ureter, will be demonstrated upon the plate in every case by proper application of the röntgen method. 3. The negative result of the röntgen method after repeated attempts allows the exclusion of a calculus. 4. The demonstration of a stone shadow upon the röntgen plate is not dependent upon the size and chemie composition of the calculus, but singly and alone upon the technic of the röntgen operator. 5. A high degree of corpulence in the patient may render the demonstration of a calculus by the röntgen method very difficult, but in general does not render it impossible. 6. In every case of nephrolithiasis it is advisable to employ the functional methods of investigation, since they show us, by combined application —

¹ Med. Rec., Aug. 8, 1903.

² Australasian Med. Gaz., Mar. 21, 1904.

³ Ann. of Surg., May, 1904.

(a) whether or not a disturbance of the whole kidney function exists; (b) whether we have to deal with a double-sided stone-formation or other coëxisting kidney disorder, or whether, in the already existing disorder, only one kidney is involved. 7. The result of the negative röntgen investigation should be considered in connection with the condition of the clearness, concentration, and freezing-point of the urine obtained by means of the ureteral catheter. Smith has skiagraphed 27 cases of suspected kidney-stone, with a positive diagnosis in 13, doubtful in 1, and negative in 13. In the doubtful case a small stone was found at operation; in the other cases diagnosis was confirmed by operation. The apparatus required consists of a coil capable of giving a heavy spark, from 10 to 20 inches in length; a tube with an adjustable vacuum capable of carrying a heavy secondary discharge from the coil and having a comparatively low vacuum; and fresh plates thickly coated to secure the largest degree of absorption of the rays. Glycin and edinol are recommended as developers. Before examination the patient should take a cathartic and abstain from food. In certain cases the colon may be dilated with air to push aside the omentum and intestines and give a more definite outline of the kidney. The tube is inclosed in a leaden cylinder, and rests upon a wooden disk faced below with lead plate having an opening in it 3 inches in diameter; this cuts off all rays except those coming from the center of the tube. The head and thighs are elevated and the back placed as closely in contact with the plate as possible. The picture should show the transverse process of the vertebra, the structure of the last 2 ribs, and the division between the psoas and the quadratus lumborum.

C. L. Leonard¹ gives the results of the **röntgen method in the diagnosis of renal calculus**. Of 320 cases examined, calculi had been found in 93. In 47 of the cases in which a negative diagnosis had been made the symptoms demanded operation, and in all but one the accuracy of the diagnosis was proved. In 3 cases of negative diagnosis small calculi were subsequently passed. Of the 93 cases in which calculi were found, there were 4 in which calculi were present in the kidney and ureter of the same patient. Including these cases there were 33 renal calculi found and 64 ureteral. Of the renal cases, 27 were removed by operation, 4 patients refused operation, and in 2 cases operation was not advised. Of the 64 ureteral, 26 have passed the calculi after expectant treatment, 15 were removed by operation, and in the remaining 23 operation was not advised. The total amount of error has been 9 cases, or less than 3 %. The negative diagnosis is based upon the axiom that "where shadows of tissues less dense than the least dense calculus are shown, no calculus can escape detection." Every patient who has suffered from an attack of renal colic unless a stone has been passed should be examined by the röntgen method. If the symptoms have entirely subsided and a calculus is present, the existence of a bilateral urinary flow ought to be ascertained.

E. H. Eising² writes of the **röntgen diagnosis of certain diseases**

¹ Amer. Med., June 4, 1904.

² Med. Rec., June 4, 1904.

of long bones. Carcinoma shows an area of rarefaction which is circumscribed and sharply demarcated. It is homogeneous, and not mottled, like osteomyelitis. The area of rarefaction is medullary, and there is no evidence of new bone proliferation. Giant-celled sarcoma shows an area of erosion of bone and periosteum appearing as if the bone had been removed by a gouge. Spindle- and round-celled osteosarcomas cause a fusiform dilation of the shaft of the bone; the periosteum is much thickened, but shows no proliferation of new bone. Chronic osteomyelitis shows an irregularly fusiform mottled swelling, often with a periosteal involucrum, sometimes a cloaca, and occasionally a sequestrum.

L. G. Cole¹ classifies skiagraphic errors according to their causes as follows: 1. Varying distance of tube from plate. 2. Varying direction of tube from plate. 3. Varying distance of tube from body. 4. Varying direction of tube from body—(a) Directly above; (b) laterally; (c) distally; (d) proximally. 5. Varying distance of body from plate. 6. Varying relation of one bone to another. 7. Varying relation of the part skiagraphed to the body as a whole. 8. Varying the angle at which the rays strike the plate by tipping the plate.

The further a solid is from the plate, the larger and more diffuse will be the shadow. The rays that strike a plate perpendicularly to the plane of its surface are more powerful than those that strike it at an angle; thus in a skiagraph of the hand with the tube directly above the tips of the fingers the phalanges show but faintly, while the bones of the wrist cast a dense shadow. To show a fracture it may be necessary to take pictures with the tube, plate, and limb in various positions. To show deformity in fractures the skiagraph of the injured limb should be compared with a skiagraph of the normal limb with the tube, plate, and part to be skiagraphed in exactly the same relative position as in the skiagraph of the injured part. This article is extensively illustrated.

Darier,² in a report to the Academie de Médecine, Oct. 6, 1903, called attention to the extraordinary **analgesic effect of radium**. He has employed it in an exceedingly painful case of epithelioma of the orbit and one of ophthalmic neuralgia which resisted all treatment for more than 6 months, and in cases of iridocyclitis and other painful affections.

J. R. Pennington³ reports 13 cases of **pruritus ani relieved by the röntgen rays**.

W. L. Heeve⁴ reports 24 cases of **chronic leg ulcer cured by the röntgen ray**. After cleansing the ulcer it is exposed to the rays for from 10 to 15 minutes; this is repeated at intervals of from 3 to 7 days. When granulation tissue forms, a brush discharge from a static machine is used for 20 minutes daily.

J. T. Dunn⁵ reports a case of **pseudoleukemia treated by the röntgen rays**. After 15 treatments the glands in the neck had shrunken and the patient gained 16 pounds in weight. Treatment was continued and the patient regained the 50 pounds in weight which he had lost. After a year the glands had not increased in size.

¹ N. Y. Med. Jour., Mar. 26, 1904.

² Medicine, Jan., 1904.

³ N. Y. Med. Jour., Feb. 20, 1904.

⁴ Am. X-ray Jour., Sept., 1903.

⁵ Internat. Jour. of Surg., Oct., 1903.

Nicholas Senn¹ reports a case of **splenomedullary leukemia treated by the röntgen ray**. Senn had previously reported 2 cases of pseudoleukemia successfully treated by the röntgen ray. In the case of splenomedullary leukemia the spleen reached nearly to the pubes and extended 2 inches beyond the median line. The blood-examination showed: erythrocytes, 3,500,000; hemoglobin, 56 %; leukocytes, 64,800. The spleen, the lower end of the sternum, and the epiphyseal extremities of the long bones were exposed daily to the action of the röntgen ray for from 10 to 20 minutes. The patient made a perfect recovery. The spleen returned to the normal size and the subjective symptoms disappeared. On several occasions the treatment had to be stopped owing to high temperature and other symptoms of intoxication.

O. W. Stienwand² reports a case of **pseudoleukemia successfully treated with röntgen rays**. The patient was a girl, aged 15, in whom the symptoms had persisted, despite various forms of treatment, for 6 years. The rays were applied daily for from 15 to 20 minutes. At one time there were symptoms of intoxication, and after 10 treatments a röntgen-ray burn developed. Three months after discontinuing treatment the neck had diminished $2\frac{1}{2}$ inches in circumference.

Kienbock³, at the January meeting of the Royal Medical Society of Vienna, exhibited a case of **recurrent sarcoma** of the upper jaw in which **great improvement occurred as the result of the application of röntgen rays**. At the same meeting Grossmann presented a case of recurrent sarcoma of the nose which had almost completely disappeared under the röntgen-ray treatment.

Krogius⁴ reports a case of recurrent multiple periosteal sarcomas of the skull in which the tumors disappeared under röntgen-ray treatment.

Tousey⁵ says, in using the röntgen ray in the treatment of cancer of the uterus, that the patient should be put in the lithotomy position and the skin protected with sheet lead. A Nott speculum, which is a bivalve speculum in which the anterior blade is split, the 2 arms separating when the speculum is expanded, is employed. In some cases a Ferguson speculum made of celluloid may be used. The tube should be of medium hardness and of large size. The anticathode should be about 9 inches from the exposed surface, and the first treatment should not exceed 5 minutes. The time of treatment is gradually increased to 20 minutes.

Nevzoroff⁶ speaks of the simplicity and ease of application of radium as compared with the röntgen ray as a therapeutic agent in rodent ulcer. In one case of rodent ulcer there was improvement as early as the sixth day. In this case a slough formed, separated, and the resulting area healed in a short time, the total time of exposure to the radium being 7 hours in 2 months.

M. K. Kassabian⁷ divides cases of malignant disease treated by

¹ Med. Rec., Aug. 22, 1903.

² Jour. Am. Med. Assoc., Mar. 26, 1904.

³ La Sem. méd., Jan. 27, 1904.

⁴ Finska Lakaresällskapets Handlingar, Aug., 1903.

⁵ Med. News, Nov. 14, 1904.

⁶ Roussky Vrach, Sept. 20, 1903.

⁷ N. Y. Med. Jour., Dec. 12, 1903.

the röntgen ray into 3 classes—those with total failure resulting, those with decided improvement, to which the majority belong, and those in which permanent cure takes place. To this class the smallest number of cases belong. He has treated 16 cases of rodent ulcer without a recurrence, some 8 or 9 having stood the 4 years' test. His results have been better in carcinoma than in sarcoma, although he has had 3 cases of sarcoma which have apparently been cured. He urges operation in all operable cases.

Wm. B. Coley¹ has treated 36 cases of **inoperable sarcoma with the röntgen ray**. In 4 cases the tumors entirely disappeared, but have since recurred. In such cases a brief course of the combined röntgen-ray and toxin treatment would be perfectly justifiable and might result in saving the limb.

Exner² reports 3 cases of **malignant disease treated with radium**. The first was a case of recurring melanosarcoma of the upper arm. A capsule containing radium bromid was placed over each nodule for from 5 to 25 minutes. A dermatitis followed, and the tumors began to decrease in size. After a month a number of the smaller nodules had disappeared. In a second case of melanosarcoma there was a marked diminution in the size of the nodules at the end of 2 weeks. The third case was one of recurrent carcinoma of the mucous membrane of the mouth. The capsule containing the radium was wrapped in gutta-percha tissue and placed against the affected part. After 6 applications of from 15 to 20 minutes the tumor began to decrease in size and finally it disappeared.

F. H. Williams³ speaks of **the value of the röntgen ray in the treatment of cancer, glandular disorders, certain skin diseases, and for the relief of pain**. In 2 cases of herpes zoster the pain and burning sensation immediately disappeared. Eczema, psoriasis, and acne respond to treatment quickly. In Hodgkin's disease the röntgen rays will prolong life and in some cases cure. Tuberculous adenitis has been successfully treated with the rays. Tuberculosis of bones will probably not be amenable to treatment, as the calcium salts obstruct the passage of the rays.

M. A. Cleaves⁴ reports 2 cases—one a **sarcoma of the cheek** and the other a **carcinoma of the pelvis**—in which **radium rays produced some improvement** in the symptoms. Cleaves says there are about 4 grams of radium salts in the possession of various observers. Radium stronger than 7000 has until recently been retained by the Curies and their associates. It is stated that a nearly pure radium bromid will be on the market at \$6000 a gram.

W. J. Morton⁵ says that it is known that the **röntgen radiation** possesses therapeutic advantages over arc-light radiations. He believes that all forms of solar, electric, arc, and other artificial lights have been entirely supplanted in their efficiency and usefulness by the rays.

¹ N. Y. Med. Jour., Aug. 8, 1903.

² Münch. med. Woch., July 14, 1903.

³ Med. News, Oct. 3, 1903.

⁴ Med. Rec., Oct. 17, 1903.

⁵ Med. News, Oct. 10, 1903.

A soft tube, as a rule, will do superficial work, while a hard tube should be selected for deeper work. In weak dosage the growth of the nails, hair, and skin is augmented, while in strong dosage their vitality is lowered or destroyed. Several cases in which a röntgen-ray burn has proved to be a nidus of cancer have been reported. A röntgen-ray dermatitis should never be produced in the treatment of an ulcerating cancer because the cancerous infiltration will rapidly follow in the track of the newly inflamed tissue. In treating an ulcerating carcinoma secondary infection may occur from the dust on the tube, which collects with great rapidity unless the ulcer is protected by borated cotton or similar material.

G. E. Pfahler¹ concludes a paper on carcinoma and tuberculosis treated by the röntgen rays as follows: 1. The rays are of undoubted value in the treatment of certain cases of both superficial and deep-seated carcinoma and tuberculosis. 2. The more a case has been tampered with, the less likely it is to yield to the influence of the rays. 3. Daily treatments carefully and properly given will produce the best results. 4. We should never try to produce a dermatitis beyond a simple erythema. 5. There are idiosyncrasies in certain people which render them most susceptible to the röntgen-rays, and in these people deeper burns may occur in spite of the most careful treatment. 6. Epithelioma involving the mucous membrane is much less likely to yield to the effect of the rays than when it simply involves the skin. 7. There is not likely to be any interference with the sense of sight, even though the rays are used directly over the eye. 8. Tuberculosis, whether of the skin or of the glands, will yield, at least in certain cases, to the effects of the rays. 9. The rays may be of value in certain cases of deafness. 10. The rays will give better cosmetic results than any other form of treatment in simple epithelioma of the face. 11. Epithelioma of the mucous membrane should be removed as early as possible by the knife, and this followed by röntgen-ray treatment. 12. Operable cases should be operated on and in each instance followed by a course of röntgen-ray treatment, and röntgen-ray treatment should be given at the first sign of a recurrence. 13. Inoperable cases should be given a trial with the rays, since even hopeless cases sometimes yield to this form of treatment. 14. It is desirable to produce a distinct reaction in the treatment of lupus. Nine cases are reported fortifying these conclusions.

The treatment of malignant disease by electric methods was discussed at the 1903 meeting of the British Medical Association.² Lewis Jones says there is a general agreement that in rodent ulcer a satisfactory cure may often be observed; that healing of an ulcerated cancerous surface has been observed in a certain proportion of cases; that relief of pain in cancerous parts is a fairly common experience; and that superficial nodules will sometimes decrease in size under röntgen-ray treatment. He believes that röntgen-ray treatment should be instituted immediately after the tumor has been removed by the surgeon, and that all masking of the surrounding parts by impervious screens

¹ Jour. Am. Med. Assoc., Dec. 5, 1903.

² Brit. Med. Jour., Oct. 24, 1903.

should be abolished for fear that the screens may shield some foci of disease. J. Hall-Edwards would not hesitate to treat with the röntgen rays any case of carcinoma in which there was no implication of contiguous glands. In some cases of internal cancer the rays did decided harm, the patients dying from a rapid toxemia. It has been suggested that after the use of the rays for a certain time the growth should be incised and drained, so that the products of disintegration might escape instead of being absorbed. He thought that a fairly high tube with a heated anticathode yielded the best results. Chisholm Williams thought the best form of general treatment were high-frequency electric currents, which, besides acting as a general tonic, might play some part in overcoming the septic condition occasionally encountered. Locally he used a special high-vacuum electrode attached to the top of the high-frequency resonator, which, when placed over the growth, emitted a powerful supply of röntgen rays and other electric discharges. Up to the present, relief of pain and offensive discharge was practically all that could be expected. V. H. Rutherford reported 3 cases of rodent ulcer, 2 of which recurred after healing and one of which has remained well for 2 years. C. H. Allfrey suggested that the internal administration of potassium iodid should accompany röntgen-ray treatment, more especially of internal parts, so that any débris caused by the rays might be more effectually absorbed. H. B. Manders advocated a blue-colored glass-vacuum electrode, and expressed the opinion that cobalt glass was the best, owing to the spectrum of cobalt being very rich in ultra-violet rays. L. Drage thought electric treatment should be combined with the subcutaneous injection of a 10 % glycerin solution of sodium cinnamate, which produces a leukocytosis. W. K. Wills reported 4 cases of recurrent carcinoma of the breast. One is apparently well after some months of röntgen-ray treatment; the second has one nodule only remaining; the third was relieved of agonizing pain, but died; the fourth is still under treatment, but seems to be receiving benefit.

Chisholm Williams¹ discusses **the treatment of tuberculous disease by electric methods**. He reports favorable results in pulmonary tuberculosis treated by the high-frequency current. In tuberculosis of other parts, bones, joints, etc., the best results have been obtained by general electrification combined with a high-vacuum electrode from the resonator or the ordinary röntgen-ray discharge. Cases of old-standing tuberculous lesions are very amenable to electric treatment. The Finsen light is no more reliable than the röntgen ray, and it has the disadvantages of expense, smallness of area treated, and length of treatment. In lupus 95 % of the cases may be cured by the röntgen rays. A 5-minute dose daily for 30 days will suffice for most cases. Williams frequently puts the tube one inch from the part for one minute. The static effluve has been used with the best results in lupus.

¹ Brit. Med. Jour., Oct. 24, 1903.

OBSTETRICS.

BY BARTON COOKE HIRST, M.D., AND W. A. NEWMAN
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SUMMARY.

PECULIAR interest this year is attached to the study of syncytiolysis, with especial reference to its bearing upon the development of malignant deciduoma. Lane's investigations upon the relationship existing between the maternal pelvis and the development of the fetus open up an entirely new field of study. The decline of the Bossi dilator is equaled only by the sudden dropping of symphyseotomy. Its fall was predicted last year in the summary of the literature on the subject.

PRELIMINARY AND GENERAL CONSIDERATIONS.

Midwives' Bill in England.—[The incapacity of British midwives has long been a potent source of danger to the indigent mothers of England, as well as a disgrace to an enlightened country. A large proportion of the poor of Great Britain are not able to afford the services of a physician when their women are confined, but must rely upon the help of the midwife. Any woman could, without any training whatever, take up the calling of midwife, and until the passing of the Midwives' Act, many entirely uneducated and incompetent persons did this as a means of adding to their earnings. The result of the laxity of the regulations as regards this matter may easily be imagined. Of late, however, the British medical profession has awakened to the gravity and also to the anomaly of the situation, and the midwives' bill, intended to remedy the defects of the existing lack of system, has become law. It is further proposed in England to establish a national training school for district midwives. At a meeting held recently at the London Mansion-house in behalf of this scheme the Bishop of London delivered himself of some common-sense remarks regarding the existing state of affairs as to parturient women. He remarked that it was an astounding fact that practically until 1902 Great Britain was the only nation in the whole of Europe which permitted any one without training to carry on the work of a midwife. About 60 % of the mothers of England were dependent in their hour of trouble upon inexperienced and untrained help. He was, therefore, not surprised to hear that in Great Britain 3000 women a year died during their confinements in the immediately ensuing period, who

need not have died if they had had qualified assistance. At the same time, one-third of the inhabitants of our blind-asylums would not have been there had their eyes been properly treated during the first hours of their life. Probably the scarcity of trained assistance was greater in the country districts than elsewhere. The decrease in the number of children throughout the Anglo-Saxon race is going to be one of the great problems of the future unless it is corrected. If, in addition to this state of things, those who are born are treated in an unskilful and clumsy way, the future of the race is indeed in peril. The proposal suggested for the training of women in all that appertains to midwifery-work is that a small general hospital should be established, with a maternity annex, in a neighborhood already in need of such an institution; this to be recognized as a national training-school for district midwives; that in the wards educated women should receive training in general and monthly nursing; that the training should be supplemented by instruction in simple hygiene, sanitation, physiology, the elements of cooking, the laws of infant-breeding, the necessity of vaccination, etc.; that the course should in no case last for less than two years; and that the midwives should return every third year for reëxamination and instruction in those advances of modern obstetrics which immediately concerned their work. [The foregoing plan is thorough and will doubtless result in the education of a number of well-trained midwives. Our stand, however, on the question of midwives in general is well known. We object to them in whatever form they are presented. We most energetically advocate the supervision of this portion of the public sanitation by the city authorities, just as they supervise vaccination and the water and sewer systems. The truly indigent merit free medical and obstetric attendance, and the appointment of district obstetricians and visiting nurses would do much to lessen the morbidity and mortality attendant upon parturition in this class of the community.]

Sterility and the Declining Birth-rate.—According to the Berlin correspondent of the *London Standard*,¹ there has been a steady decrease in the number of births in Germany during the past few decades. From 1870 to 1880 the number of births was 40.7 for every 1000 inhabitants; during the following decade it fell to 38.2 per thousand; and from 1890 to 1900 it was not more than 37.4 per thousand, or about as much as during the fifties. This decrease, however, has hitherto been compensated for by the decrease in mortality. From 1890 to 1900, for instance, the death-rate decreased by more than 2 per thousand. In Berlin the decrease in the birth-rate has been especially marked, the total number of births in the capital being 1700 less in 1903 than two years ago. The actual number of births in Berlin was 49,000 in 1903, and 52,259 in 1901. [It has been asserted often, and especially during the past few months, that a decrease in birth-rate goes hand-in-hand with an increase of education. At first sight this view of the question does not seem to be an unreasonable one, judging from the experience of the past. Rome and Greece were, perhaps, never more highly educated and cultured than

¹ *Med. Rec.*, Mar. 19, 1904.

when in their decadence and when the birth-rate of their native-born inhabitants was at its lowest. In modern times France is the most cultured, if not the most highly educated and learned, of nations, and in that country the birth-rate is the lowest of any land. A distinction must doubtless, however, be drawn between culture and education, for that education does not necessarily imply a decreased birth-rate is shown by the case of Germany, in which country mental training has been carried to the highest possible pitch, and where, too, the birth-rate is large and increasing.]

The Female Breasts and the Genital Organs.—R. Temesvary¹ discusses the connection between the female breasts and the genital organs. To prove the existence of this connection he gives instances first of genito-mammary and, secondly, of mammary-genital action. In the first group are included: (a) The mammary changes at puberty. That these changes depend on the genital organs is proved by their occurrence in nearly every case of precocious menstruation. (b) Mammary symptoms at the menstrual period, and occasionally mammary hemorrhage as a form of vicarious menstruation. (c) Mammary changes during gestation and the puerperium. Abnormal as well as normal breast-phenomena occur during these periods. Thus, new-growth in the breast sometimes arises, or, if already present, develops with greater rapidity, during pregnancy, and, according to Naegele, the site of a healed mastitis may become tender and painful at this period. While there is no change in the breast among women during and immediately after parturition, among animals the skin over the lacteal glands is already tense and reddened when parturition occurs, and the glands secrete colostrum more freely. (d) Mammary changes often accompany disease of the genital organs. In cases of uterine myomas the breasts often secrete colostrum, and hypertrophy of the breast has been cured by amputation of an accompanying hypertrophied cervix, while atrophy of the genital organs causes atrophy of the breasts. (e) Cases of inoperable cancer have been improved or even cured by removal of the ovaries combined with the administration of thyroïdin. The instances given of mammary genital phenomena are: (a) Effects on the genital organs of sucking the nipple. In some women this causes erection of the clitoris and contraction of the muscles of the pelvic floor. In pregnant women it leads to uterine contraction, and may induce premature labor. After parturition the involution of the uterus is completed in 6 weeks in the case of nursing women, but takes from 7 to 8 weeks in nonnursing women. Over-prolonged lactation sometimes causes hyperinvolution of the uterus. Lactation acts favorably on uterine myomas. (b) Irritation of the skin of the breasts sometimes causes uterine hemorrhage in amenorrhea. Freund employs cupping of the nipple to produce uterine contraction, and warmly recommends the procedure as a preparatory measure before inducing labor. (c) Galactorrhea is occasionally associated with amenorrhea, and galactagog drugs in large doses have usually a galactagog action, but cause uterine hemorrhage. Temesvary discusses the

¹ Jour. of Obstet. and Gynecol. of the Brit. Emp., June, 1903.

cause of this interaction between the breasts and genital organs. The connection might be brought about through the nerves or through the circulation in the breasts or reversely. But it has been shown experimentally that the secretion of milk may take place in animals in a normal manner after section of the spinal cord at the level of the dorsal vertebrae, or when the breast has been entirely freed from the influence of nerves. Similarly, cases are on record in which the breast-changes of pregnancy and the puerperium developed normally in women after destruction of part of the spinal cord at the level of the dorsal vertebrae. None of the nerves is, therefore, unconditionally necessary to the milk-secretion. That the circulation in the breasts is not the essential factor is shown by an experiment of Ribbert, who cut off the mammary gland of a young rabbit and transplanted it in the ear. Five months afterward, on the rabbit bearing two young ones, this gland secreted milk freely. The only explanation left is that some substance is secreted by the ovaries which, circulating in the blood under certain circumstances, leads to the secretion of milk. During pregnancy this substance must be utilized in the circulation of the fetus, and only after the birth of the fetus accumulates in the mother's blood to cause the secretion. Experiments showing that healthy ovaries are necessary for lactation bear out this theory, though it is not proved until such a toxin or the blood-serum containing it can be produced and its effects watched. Apart from experiment it is undeniable that the circulation itself has some effect on the secretion of milk. In producing mammary-genital phenomena the sensory nerves of the nipple, probably a reflex center in the cord, and the motor nerves of the uterus, play a part. The conclusion at which Temesvary arrives is that the stimuli going from the genitals to the breasts are produced by some product of the internal secretion of the ovaries, and that the blood-circulation, influenced by the nervous system, plays only a secondary part. In the reverse direction the stimulus is chiefly produced by the nervous system, and the blood circulation here plays a secondary part in the form of reflex hyperemia.

[This theory cannot be said to be unassailable. It scarcely explains the phenomena of imaginary pregnancy, cases in which fully developed breasts are found with defective or absent uterus and ovaries, or those conditions apart from pregnancy in which milk is found in the breasts.]

THE PHYSIOLOGY OF PREGNANCY.

The Determination of Sex.—This interesting physiologic question is still further discussed by no less an eminent authority than Professor B. S. Schultze, of Jena, who writes as follows: "In 1855 I expressed my opinion that all the conditions necessary for the development of either one sex or the other from an ovum were decided in the ovary, and wrote: 'All twins with a common chorion, like all double monsters, are of one and the same sex; reported cases of the contrary always prove, when accurately investigated, incorrect, the apparent difference in sex turning out to be no more than an arrested development of the genital organs. When in con-

nection with this we also consider the fact that actual hermaphroditism—the coëxistence in one individual of testes and ovaries, of masculine and feminine germ-furnishing organs—has never been observed in the human being, nor, save perhaps in the most exceptional cases, in the other mammalia, it is evident that from a mammalian ovum only one sex, either masculine or feminine, can develop. Moreover, it is certain that, by the simultaneous fertilization of more than one ovum, embryos of different sex may develop, and it is therefore probable not only that the cause of sex does not lie in the seed of the male, but rather that the conditions for the development of the one or other sex are present in the ovum even in the ovary." No one now maintains the old ideas that one ovary furnishes male, the other female, ova; one testicle male, and the other female, seed; the evidence against them is too strong. Both boys and girls often enough have developed from the ova of one ovary after the extirpation of the other, and have been begotten by seed from one testicle after the removal of the other. Nor does any one still believe that from an embryo, as long as it does not exhibit characters of its sex, that is to say, in the human being for about 6 or 7 weeks, an infant of either sex may possibly develop.

Döderlein¹ very justly says that it is not consistent with the view that an embryo already developing in the womb can be of undetermined sex to suppose that the father exerts any influence upon the sexual character of the offspring. Yet certain ascertained statistics offer very strong evidence of the action of such an influence. In the first place, the older the father is, in comparison with the mother, the more does the excess of male infants exceed the average proportion of male births (Hofacker, Sadler, and others); and, secondly, to breeders of horses and cattle it is a well-known fact that the stallion or bull upon whom more demands are made, which is allowed to cover 60 or even more females in the year, will beget a larger proportion of male offspring than one which has to fertilize only 20 or 30 females. From the first of these facts Döderlein concludes that it is not right to suppose that the ovum is primitively endowed with a definite sex, "otherwise it is self-evident that the age of the begetter could not be a factor in the determination of the sex of the offspring." Of course, it could not in that of the embryo from any particular ovum, but very well might be in determining the proportion of sexes born. It is quite possible that the seed of the older man is more adapted to fertilize male than female ova, and though we do not yet know absolutely that this is the case, Schultze thinks it important to point out that the facts ascertained by Hofacker and Sadler are not conclusive proof that the ovum in the ovary is not of a definite sex.

Lenhossek argues in favor of the definite sex of the ovum in the ovary on the ground especially of thoroughly discussed biologic analogies, as well as on that of the identical sex of uniovular twins. At the conclusion of his treatise he says: "Scientific research has, as we have explained, . . . led us to accept as a fundamental fact, almost indubitable, that in the animal kingdom the determination of sex is

¹ Deut. Rev., 1902.

a prerogative of the maternal organization, and precedes the fertilization of the ovum." And on an earlier page: "Men must therefore resign themselves to the idea that to them no direct influence in the determination of the sex of their children is accorded, and that this determination is entirely left to the organism of the female individual." The possibility of even an indirect influence he admits only so far as, for example, the peculiarity of having more male children may be transmitted through the son to the granddaughter. The ascertained statistics of Hofacker and Sadler, which he terms suppositions and hypotheses, he treats as controverted, though to Schultze they seem to be facts as well ascertained as the above-mentioned results in horse- and cattle-breeding. The apparent contradiction between these facts and the theory that the ovum in the ovary has a definite sex disappears if we suppose that the seed of the older man is better adapted to fertilize the male than the female ova of the younger woman; that spermatozoa fresh from the testicle of an actively employed stud male is more effective in impregnating the male than the female ova of the dam. Or the hypothesis may be put in this way: The male ova derived from the ovary of a young woman offer more attractions to the spermatozoa of an older man than the female. The male ova of the dam are more accessible to spermatozoa coming fresh from the testicle of the covering male than the female, and the latter are, on the whole, more accessible to spermatozoa which have for some time been ready waiting their discharge from the male organs. It is, at all events, certain that even the prerogative of the male to influence the comparative number of his male and female offspring is not inconsistent with the theory that even in the ovary the sex of every ovum is already decided.

Syncytiolysis and Hemolysis.—Scholten and Veit¹ contribute a paper upon this subject. They find that the blood in pregnancy shows great variation. This results from fragments of chorionic villi carried into the circulation, and from the influence of erythrocytes and leukocytes and epithelia of the chorion upon one another. The result of this interaction is the formation of syncytiolysin as a side-chain of erythrocytes, and hemolysin as a side-chain of epithelia of the chorion. Hemoglobin is thus dissolved from the erythrocytes, and protoplasm from the syncytium into the serum. The albumin from the maternal blood found in the serum is transferred to the fetal blood. Those albuminoids which are precipitated from maternal blood through the fetal serum do not enter the fetal circulation, and, also, those substances which are precipitated from the fetal serum through the mother's do not enter the maternal circulation. The nourishment of the fetus is secured by the albuminoids dissolved in serum, while nutritive material is given up into the maternal serum from the epithelia of the chorion through syncytiolysis. The fact that albumin derived from fetal bodies may again enter the fetal organism because it is dissolved in the maternal serum is accounted for by the scanty fetal contents. The application of the side-chain theory to the phenomenon of the transfer of chorionic villi has not only given us a

¹ Zeit. f. Geb. u. Gyn., 1903, Bd. xlix, Heft 2.

better understanding of the changes occurring in pregnancy, but also a better knowledge of fetal nutrition. The entrance of fetal elements into the maternal circulation secures the metabolism of the fetus. The balance of nutrition between fetus and mother is disturbed when too great a number of villi are absorbed; then follows excessive hemolysis, with hemoglobinemia, albuminuria, hemoglobinuria, and feeble syncytiolysis, as illustrated in eclampsia in which syncytium from the villi are found unchanged in the arteries of the lungs. When the absorption of villi is diminished, the changes in pregnancy are also lessened, while the nutrition of the fetus remains good. We must refer these changes to alterations in the anatomic condition of the uterus, to deficient development, or to the presence of inflammation producing diminution or increase in the absorption of chorionic villi.

The Deportation of Chorionic Villi and its Consequences.—[The clinical significance of the interesting phenomenon of deportation of chorionic villi into the maternal system during pregnancy for the last few years has been the subject of much fruitful study.] J. Veit,¹ the originator of this theory, presents a concise and complete résumé of all the various hypotheses that have been based upon his observations, carefully differentiating between those that are still under discussion and those that are generally accepted at the present day. The fact that during pregnancy chorionic villi are torn off and carried into the circulatory system of the mother is well established. The simple mechanic effect of this occurrence is manifold. Thromboses form in the serotinal veins. On account of numerous anastomoses existing between the veins of the deeper layers of the serotina, disturbances of practical importance, however, do not result. The intervillous spaces become enlarged. Chorionic villi entering into serotinal veins transform them into intervillous spaces, a fact that has been convincingly shown on pregnant tubes, but not yet, however, on the pregnant uterus. In serial sections of placental polyps, centrally situated maternal veins have been found filled with living villi. It would seem that deportation of villi into the veins of the decidua is a frequent cause of the formation of placental polyps. Abnormally firm adherence of the placenta and the development of a placenta disseminata are explained by the fact that under certain conditions chorionic villi are carried through the serotinal veins within the uterine wall. The deportation of villi plays an important rôle in the premature separation of the normally implanted placenta. Clogging with villi of either the sinus circularis or the vein carrying the blood from the cotyledons leads to a rupture of the vein, causing a hemorrhage between the placenta and the serotina. Sudden hemorrhage of a very severe character in cases of rupture of a pregnant tube may be due to the rupture of veins clogged with deported villi. Veit suggests that the same phenomenon in an analogous manner may be of importance in the etiology of the spontaneous rupture of the pregnant uterus. Of eminent practical interest is the deportation of villi in cases of hydatidiform mole and malignant chorio-epithelioma. In Veit's opinion many cases of so-called "destructive" hydatidiform mole

¹ *Zent. f. Gynäk.*, 1904, No. 1.

can be explained simply upon the theory of deportation. The epithelial cover of the deported villi sometimes shows signs of an atypic proliferation, as it is seen in cystic degenerated villi within the uterus. But although this new-formed tissue often exactly resembles chorio-epithelioma, and would seem to be malignant in its microscopic features, clinically it is benign. This peculiar fact is, in Veit's opinion, easily explained by the now almost generally accepted observation, that even after the death of the fetus the enveloping membranes of the ovum may continue to grow and to functionate. The following interesting theory of the formation of the hydatidiform mole is suggested: The fetus is dead, the cover of the villus continues to functionate—even grows. Fluids are resorbed as usual from the maternal blood, but on their way to the interior of the ovum they cannot pass through the dying connective tissue of the villus. They are retained there, and cause the transformation of the villus into a cyst. Nodules in the paravaginal tissue containing chorionic villi which show the microscopic picture of malignancy, are not necessarily metastases of a chorio-epithelioma or of a "destructive" hydatidiform mole. The claim of various writers that deported normal chorionic villi may undergo malignant degeneration in their new location is, in Veit's opinion, not yet positively established. Another feature of practical importance is the possibility of dissemination of germs with the deported villi. Numerous hypotheses have been advanced, based upon Ehrlich's side-chain theory. It is very probable that cytolytins or syncytiolysins are formed by the action of the maternal blood-serum upon the deported villi. By means of animal experimentation the fact has been established that the injection of chorionic tissue will produce albuminuria—even cause the death of the animal. The view is gaining ground that the kidney of pregnancy and especially eclampsia are due to these syncytiolysins, and only of late a writer tries to prove his contention that hyperemesis gravidarum is produced by these same toxins. Veit refers to the attempts of Opitz and Weichardt to produce, in conformity with this new conception of the etiology of eclampsia, a serum for the treatment of this disease. He is very skeptical concerning the success of their efforts.

Early Placenta Formation.—J. M. Swan¹ describes a human embryonic vesicle showing early placenta formation (Fig. 36). The patient was believed to be 6 or 7 weeks pregnant. The specimen was a spheric, fleshy mass, brown in color, about 0.5 cm. in diameter. On section, it was found to contain a cavity, which was lined by a membrane that resembled amnion in appearance. Microscopically this membrane proved to be chorion, with its villi projecting into the maternal blood-spaces, and bathed in the maternal blood. The villi are seen to be composed of fetal mesoderm, which is limited by two layers of tissue: first, a layer of distinctly outlined columnar cells, each containing an oval nucleus; and, second, a continuous layer of cytoplasm containing irregular nuclei, but showing no demarcation into cell-areas. The former of these layers, known as the layer of Langhans, is formed of the fetal ectoblastic cells,

¹ Am. Jour. Med. Sci., Mar., 1904.

which are the remains of the trophoblast; and the latter is the syncytium, a descendant of the trophoblast. The tissue at the periphery of the section is the decidua placentalis, and shows the dilated vessels which ramify in it. [The earliest recorded human placenta that has been examined is that described by H. Peters, of Vienna, in 1899. The following is a brief review of Peters' conclusions, after studying the appearance of the developing embryonic vesicle, which he estimated to be 4 days old: By the time the impregnated ovum reaches the uterine cavity it is surrounded by a chorion, which is covered on its free surface by epithelial cells of ectoblastic origin. The embryonic vesicle is lodged in a fold of the decidua, and, by a process of erosion, eats its way into the stroma of that membrane, the point of entrance of the embryonic vesicle into the stroma of the de-

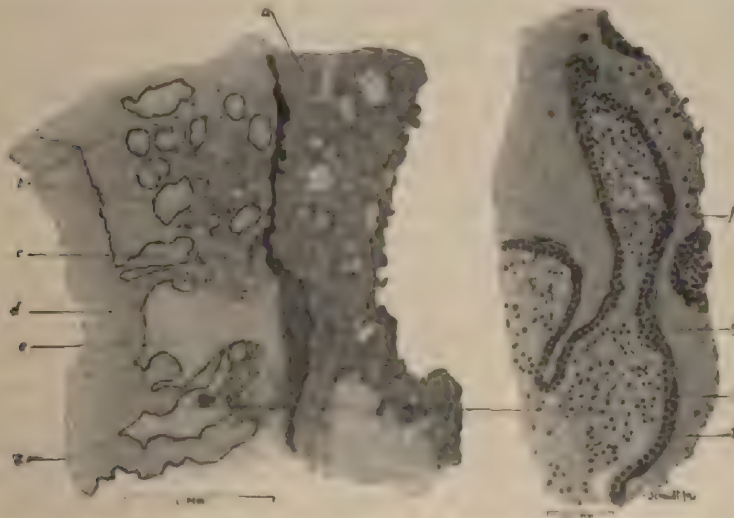


Fig. 36.—Section of young human placenta: *a*, Decidua placentalis; *b*, chorionic villi in cross-section; *c*, chorionic villi in longitudinal section; *d*, chorion; *e*, maternal blood-space; *f*, mesodermic core of chorionic villus; *g*, red blood-corpuscles in maternal blood-spaces; *h*, layer of Langhans; *i*, syncytium (Swan, in *Am. Jour. Med. Sci.*, March, 1904).

cidua being marked by a blood-clot. In this way the decidua placentalis is produced between the muscular wall of the uterus and the embryonic vesicle, and the decidua capsularis is produced between the embryonic vesicle and the cavity of the uterus. The epithelium of the chorion proliferates and forms a dense mass of cells known as the trophoblast, which presents villous projections with intervillous spaces. The villi grow into the decidua placentalis and become attached to the deeper layers of that tissue or to the muscular wall of the uterus, coming in relation as they grow with the dilated decidual capillaries. By phagocytic action the cells of the trophoblast absorb the endothelial lining of these capillaries, allowing their contained blood to lie between the projecting villi. The villi, at first simple, subsequently become branched, the branches lying free in the decidual blood-spaces. Coincidentally with these changes

the chorionic mesoderm becomes vascularized by the ingrowth and extension of the allantoic bloodvessels, by which means the fetal blood is carried into the chorionic villi in close relation with the maternal blood-spaces. The maternal blood on the one side and the fetal blood on the other side absorb the cells of the trophoblast until only two layers are left—the layer of Langhans and the syncytium. In the future development the former layer is absorbed, so that in the placenta at term the syncytium is all that remains of the original ectoblastic covering of the chorion. Then the fetal blood is separated from the maternal blood by the syncytium, the interposed mesoderm of the villus, and the endothelium of the fetal capillaries.]

The Relation Between the Pelvis and the Fetus.—[One of the most interesting problems in connection with the physiology of the unborn fetus is the question of the factors concerned in its growth. When we consider, as Ballantyne points out, the complexity of fetal nutrition, it is not surprising that our knowledge of the subject is of the scantiest description. It is a matter of everyday observation that in different pregnancies children of the same mother born at full term may vary markedly in size. How are we to explain these marked differences in development? Many writers have attempted to do so, with a varying amount of success. In 1879 La Torre considered the whole question of the development of the fetus very fully and discussed the different factors concerned. One very important point was brought out by his investigations and by those of Budin, Pinard, and others—namely, that the fetus acquired the same development and size in contracted pelvis as in normal pelvis. The size of the pelvis, then, in cases of pelvic contraction bears no relationship at all to the size of the fetus born through it. Further researches have only tended to confirm these observations. The factors concerned in the growth and development of the fetus are undoubtedly very numerous, and no single one can in the present state of our knowledge be said to be of paramount importance.] C. A. Lane¹ brings forward a new theory on this subject. He has carried out a clinical comparison of the maternal pelvis and of the fetus in a number of Europeans, Eurasians, and Bengals; and as a result of his investigations he enunciates the following law, by which the size of the child at birth is to be determined. “The child grows *in utero* in such a manner and at such a rate that at full term his size is proportional to that of the mother's pelvis, through which it has to pass in order to be born.” The size of the pelvis was determined from the measurements of the intercrural and interspinous diameters and of the conjugate diameter, the latter being measured through the abdomen at a time after delivery when the uterus had involuted so far as to be below the level of the pelvic brim. From a consideration of these measurements Lane comes to several very important conclusions. He confirms the fact, long known, that the length of the interspinous and the intercrural diameters bears no definite relation to the length of the conjugate diameter. He shows, however, that the length of the interspinous diameter if the intercrural diameter be taken as 100 bears a percentage relation-

¹ Lancet, Sept. 26, 1903.

ship to the length of the conjugate diameter, so that as the conjugate diameter increases this percentage becomes less. The further fact is demonstrated that the result of the admixture of the native race with the European is to diminish the measurements of the pelvis of the latter in all its diameters, while, on the other hand, the measurements of the heads of the children show a definite increase in size with the greater admixture of European blood. By far the most remarkable conclusion, however, come to by Lane is that the weight and size of the child's body and the size of the head (all cases of pelvis with a conjugate measuring less than 3.75 inches being excluded) bear a definite relationship to the size of the conjugate diameter of the pelvis through which the child has to pass. His tables tend to show that every step in increase in the size of the conjugate diameter of the pelvis is accompanied by an increase in the average size of the child, with the exception of children born through pelves with a conjugate diameter of 3.5 inches or less. As we have already pointed out, it has been conclusively shown by Budin, La Torre, and others that the size and development of children born of mothers with contracted pelves are normal. They are as well developed at the different periods of pregnancy as the children of mothers with a normal pelvis. To overcome this objection, which Lane recognizes, he excludes from consideration all pelves with a conjugate diameter of less than 3.75 inches. He holds that such pelves cannot be considered as produced by normal laws of growth; they are not due to a hereditary condition capable of being transmitted to the child, but to an acquired peculiarity not capable of being so transmitted; these apparent exceptions need not, therefore, be held to invalidate the general law. While we must admit that most of the cases of contracted pelvis that are met with are due to conditions acting after birth, yet this is by no means always the case; there are many recorded instances of patients with contracted pelves in which the size of the child bore not the least relationship to the size of the pelvis, and in which the deformity of the pelvis was of a congenital character. If the new law enunciated by Lane is to hold good, it would require that all the children of any mother should be of approximately the same size, and yet we know that this is very far from being the case. He does not appear to consider this objection at all, and his cases do not seem to include any instances of two children born of the same mother. [Lane's observations are of much value and represent a line of investigation in which but little work has yet been done—namely, the relationship of the size of the child to that of the pelvis through which it has been born. The number of cases that he records is much too small, however, to allow of any such sweeping statements being made as that which he has deduced, nor do we consider that the methods adopted are sufficiently accurate. To prove such a contention we think that a series of measurements of the pelvis carried out either on the cadaver or on the living subject under anesthesia would be necessary, since differences of so small a measurement as one-fourth of an inch are in question. That a general relationship exists between the size of the pelvis as a whole and the size of the child's head is, of course, well known, and is illustrated by the measurements of

the heads and pelves of the lower races, but the researches of Budin and Ribemont have shown that the size of the head of the child and the length of the child's body, although they tend to increase with an increase in the weight of the child, yet by no means do so in proportionate manner. The problem is a fascinating one, and we could wish that its solution was so simple as Lane would have us believe, but we are afraid that it is not. If the explanation of the varying size of newly born children is so simple as this, then we must eliminate the paternal factor altogether, an influence which, according to La Torre, is of much importance. Whatever may be the case in man, no one can doubt the influence of the male parent upon the size of the offspring in the case of animals. The obscurity of the whole matter is still further illustrated when we consider that the size to be attained by the fetus is probably determined before the second month of its existence. No doubt heredity plays an important part, but whether the part is that assigned to it by Lane is a matter for the future to decide. The figures quoted are undoubtedly most striking, and certainly call for further investigation, but we question whether they will be found to hold good when larger series of cases are taken into consideration.]

THE DIAGNOSIS OF PREGNANCY.

Johnson's Sign of Early Pregnancy.—H. L. E. Johnson¹ announces a new sign of pregnancy, which he describes as follows: "This sign is observed as early as the fourth week, or possibly earlier, and consists of an intermittent softening and hardening of the vaginal portion of the cervix uteri, with, in many cases, a change of color from a pale violet to the normal pink hue, or the reverse. These changes in consistence and color are rhythmic, more or less. The alternate softening and hardening can be easily detected by digital touch, while changes in color may be seen through a speculum." He has observed it a very large number of times, and has found it invariably present in cases of pregnancy. L. M. Giffin and O. M. Gilbert² have observed this sign in the fundus uteri in a woman 3½ months pregnant upon whom an abdominal section was performed for the relief of intestinal obstruction due to a twisted right parovarian cyst. The alterations in color from a pale to a bright pink occurred at one-minute intervals, the change beginning in the center of the fundus and passing outward in the form of a circle toward the periphery as a clear-cut circular wave.

THE HYGIENE OF PREGNANCY.

The Influence of Diet in Pregnancy on the Weight of the Offspring.—D. Noel Paton³ states that Prochownik, wishing to ascertain whether by reducing the diet of the mother the size of the child might be so diminished that labor should be facilitated in case of narrow pelvis, made a study of 48 cases. He gives as the result of regulation of diet

¹ Jour. Am. Med. Assoc., Feb. 20, 1904.

² Ibid., Apr. 23, 1904.

³ Lancet, July 4, 1903.

that the average weight of the child was in 24 males 2960 gm. (6½ pounds), being a reduction of 11 %; in 24 females, 2735 gm. (6 pounds), a reduction of 14 %. Paton made a similar test with guineapigs, one series of 7 being fully fed and another kept on a low diet. The average weight of the offspring of the latter was 28 % below that of the normal animal, and 10 % less per gram of the weight of the mother. These observations, though few in number, are so concordant that they warrant the conclusion that the size of the offspring depends very directly upon the diet and nutrition of the mother during pregnancy. While this explains the easy labors among the healthy lower classes and confirms Prochownik's conclusion that by dieting the mother the children of rickety women may be so reduced in size as to be viable, it also probably helps to explain the very high infant mortality among the very poor. The infant starts life at a low level and readily succumbs to the hardships to which it is too often subjected. The nourishment of the maternal tissues seems to take precedence over the nutrition of the fetus. Had the embryo the prior claim to nourishment, we should find that in badly nourished mothers each gram would produce a greater proportionate weight of young than in well-nourished mothers. This is exactly the reverse of what occurs. The mother thus appears to pass on the surplus nourishment to the fetus, and the better the nutrition of the maternal tissues, the greater is the growth of the young *in utero*.

PATHOLOGY OF THE FETUS AND OF THE FETAL APPENDAGES.

Deciduoma Malignum.—At the meetings of the Obstetrical Society of London held on June 3 and 16, a most interesting discussion took place upon the subject of deciduoma malignum. It was opened by J. H. Teacher,¹ who read a paper based not only upon a large number of original observations, but also upon some 188 cases which he had been able to collect from the literature and illustrated by a series of microscopic preparations shown in the epidiascope. There are at the present time 3 distinct theories upon the nature and origin of this curious growth. The first is that it is a rapidly growing sarcoma with masses of syncytial cells contained within it; the second—Veit's view—is that it is a sarcoma growing in a uterus which has recently been the seat of a pregnancy; and the third, the view of Marchand, is that it is a tumor of an epitheliomatous nature derived primarily from the undifferentiated trophoblast, that is, the primitive fetal ectoblast, and containing cells representing both the syncytium and the layer of Langhans, or the outer coverings of the villi into which the trophoblast ultimately becomes developed. Teacher brought forward a large amount of evidence in favor of this last view, and pointed out that upon the Continent it was supported by practically all those who had paid special attention to this subject. That these tumors are in every case connected with a previous pregnancy may be held to be proved. It is true that in a few cases the existence of such

¹ Lancet, July 4, 1903.

a pregnancy has not been shown with absolute certainty, but the causal relationship between the two conditions can no longer be doubted. Since the meeting of the Obstetrical Society in 1896, at which this subject was discussed, a very large amount of work has been done and many new cases have been described. The researches of Peters, Carl Spee, and others have enlarged our knowledge of the anatomy of the early ovum and of the development of the fetal membranes. It has been shown that the primitive ectoblastic covering of the ovum, the so-called trophoblast, invades the uterine tissues and plays an important part in the embedding of the ovum in the decidua serotina. In view of this physiologic action of the trophoblast it is not surprising to find that in certain conditions these cells have the power of invading the maternal tissues and even of giving rise to metastatic growths in other parts of the body. And when we remember that the development of the intervillous circulation is mainly due to the erosion of the walls of the bloodvessels of the uterus by the trophoblast, it is easy to understand that the spread of these metastatic growths takes place mainly through the blood-stream. It can no longer be denied that the weight of evidence at the present time is in favor of the view that these tumors take origin from the epithelial covering of the chorionic villi, and that they are of the nature of a chorio-epithelioma. The theory expressed in the name deciduoma, that the growth arises from the decidual cells of the mother, must be given up, and it cannot be said that there is any conclusive evidence in favor of Veit's view. The occurrence, too, of cases—at one time almost inexplicable—where secondary growths are found without the presence of any primary growth is easily understood when we remember that the transplantation of normal chorionic villi from the uterus to different parts of the body has been demonstrated to occur by Schmorr and others. The view of Peters that the syncytium is really due to degenerative changes affecting the cells of the trophoblast and is probably produced by the action of the maternal blood affords an explanation of the fact that in some of the tumors described there is no syncytium to be found. The old idea, therefore, that a growth could not be a deciduoma malignum unless syncytial masses were present must be abandoned. In those cases in which there are no syncytial masses but only discrete syncytial cells the resemblance to a sarcoma is very close, and it is not surprising, therefore, to find that the relationship of the deciduoma malignum to the sarcomas is still believed in by a number of observers. A tumor composed of cells derived from the layer of Langhans alone will lend still further support to such a view. At the present day, however, as Teacher clearly showed, the evidence points very strongly to the origin of these malignant growths from the epithelium of the trophoblast, and there for the time the matter will be left. Whether they are best classed among the carcinomas or the sarcomas is a question that future investigations will no doubt decide. Of more absorbing and deeper interest are the many other problems connected with these strange tumors. Do they represent an invasion of the tissues of the mother by a malignant growth derived from a fetus,—that is, from a son or daughter,—or are they the result of a malignant growth

arising in an included ovum—that is to say, from a brother or sister of the host? The latter would appear to afford a possible explanation of their occurrence in the male. If we may accept this so-called ovular origin for such tumors, then the fact that they are met with in growths of the testis, and, as in the specimen shown by J. Ritchie to the London Obstetrical Society, even in a dermoid tumor of the anterior mediastinum in a male, is not so extraordinary as it at first sight appears to be. In such a case the containing tumor must be regarded as an embryoma—that is to say, a tumor arising from tissues of the developing fetus, which during development have been separated from the normal aggregation. Apart from these questions of pathologic anatomy there are many clinical problems requiring elucidation. What is the exact relationship between a hydatidiform mole, a malignant hydatidiform mole, and a deciduoma malignum? What produces the malignant change in the mole and what is the cause of the diminished resistance in the maternal tissues? Why are tumors containing villi less malignant than those in which no such structures are found, and how is the disappearance of the secondary growths that at times occurs after the removal of the primary growth to be explained? These are among the many problems with regard to deciduoma malignum which this discussion has shown yet to await solution.

A. L. Galabin, in the discussion of Teacher's paper, said that he had from the first been a believer in the view that the so-called deciduoma malignum was the result of pregnancy and that it was a fetal epithelioma implanted upon the mother. He had listened, therefore, with great satisfaction to the convincing demonstration which Teacher had given of both these propositions. He had been himself convinced by the relation not so much to pregnancy as to vesicular mole. The frequency of vesicular mole was estimated at only about 1 in 2000 pregnancies.

Not more, therefore, than about one woman in every 20,000 at the most would have had at any given time a vesicular mole within a year. But in deciduoma malignum vesicular mole was the antecedent in something like half the cases, and this proportion had been maintained from the earliest record up to the present. There was already at the time of the discussion in the society in 1896 ample demonstration that there was a causal relation between vesicular mole and deciduoma malignum, since out of 40 cases then recorded vesicular mole had preceded in 18. When the number recorded had reached 90, the number preceded by vesicular mole was 49. The relation to pregnancy in general would hardly be denied if that to vesicular mole were admitted, especially since the disease more often followed an abortion than a full-term pregnancy. The existence of a similar structure in some cases of sarcoma of the testis was then quoted as an objection to deciduoma malignum being a result of pregnancy. But if such a structure were found only in tumors classed as embryomata from their resemblance to the imperfect development of an ovum, he thought that this was not an objection, but an argument in favor of deciduoma malignum in the uterus being derived from a fertilized ovum. Even if a structure resembling deciduoma malignum were found in other

parts of the body, this would be no argument against its specificity in the uterus, or its being the result of pregnancy there unless it could be shown that in the uterus deciduoma malignum occurred quite outside the age of possible pregnancy. Since malignant disease of the body of the uterus was much commoner after the menopause than before, deciduoma malignum, if it were an ordinary tumor, should be found long after the menopause. But, on the contrary, the average age for it was 31 years—just the middle of the period of fertility. Although cases had been recorded up to the age of 55 years, and as much as 2 years after the menopause, this was obviously no proof that they were not the result of pregnancy, since the disease might be latent for a time. It was a further step to show that the tumor was a chorio-epithelioma. The chief proofs were the continued vitality of villi after the death of the embryo, as shown at the last meeting of the Society by a section of ovum retained 5 months *in utero*; the identity of appearance of the syncytium and the cell-masses of deciduoma malignum, with the syncytium and cell-masses seen early in pregnancy and especially in vesicular mole; the continuity of the syncytium with the syncytium of the villi when the villi were present in the tumor; and the few cases recorded in which actual villi were present not only in the primary growth, but in metastases. He had shown at the last meeting a section of vesicular mole with cell-masses as well as syncytium resembling those of deciduoma malignum. The same was shown still better in the beautifully stained sections exhibited by Stevens—one from his (the speaker's) case of deciduoma malignum. The size and appearance of the cells, their nuclei, and the karyokinetic figures in them were identical. He did not, however, think it advisable to change the name, since if a name were in general use, it did not matter much that its derivation was erroneous. No one wanted to change the names of decidua reflexa or decidua serotina. In the term of "deciduoma malignum" had been comprised a definite clinical group of tumors, characterized not only by their causation, but by their high malignancy and tendency to form metastases both in the neighborhood and in the viscera and to lead to extensive necrosis and the formation of blood-spaces. Some few of these showed only cells and no syncytium and had the appearance of sarcoma. They were, therefore, certainly not syncytioma, and it was difficult to show them to be chorio-epithelioma, although he believed that they might be such in their origin. He did not think that Teacher's figures showed so conclusively that the cell-masses of the tumor were directly derived from Langhans' layer of the villi. The point could best be studied in the vesicular mole, which showed similar cell-masses. If these were so derived, the first step ought to be the formation of a cluster of cells covered in a cap of syncytium. He had occasionally seen this, but more often the cell-masses appeared to be separated from the villus by the syncytium. If the syncytium and Langhans' layer were both modifications of the fetal epiblast, it seemed probable that one might be converted into the other and that syncytium might become differentiated into cells.

Antenatal Rigor Mortis.—Medical jurists can no longer doubt that this condition may and does take place before the expulsion of the fetus

from the uterus; and, says Kedarnath Das,¹ that its presence in the new-born infant is not necessarily proof of life apart from the mother—of, in fact, an independent existence. In all there have been 39 such cases reported. The rarity with which it has been observed may be explained by the following circumstances: (1) The fetus has probably gone through the rigid stage before birth; (2) the obstetrician generally remains busy with the mother; (3) out of respect to the relatives and friends of the patient the physician does not like to examine the fetus critically after it has been found dead; (4) probably the attention of very few obstetricians is directed to this point. In a case of Das's the fetal movements had been most violent, but half an hour later no fetal heart-sounds were audible. He is inclined to believe that prolonged gestation after the period when labor comes on spontaneously may be an important factor in the production of antenatal rigor mortis.

Cicatrical Constriction of the Abdominal Wall Attributed to Compression by the Umbilical Cord.—C. O. Hawthorne² reports a case of complete girdle constriction of the abdominal wall. The cicatrix appears to involve only the superficial skin, but it adheres to the abdominal walls to such an extent that it produces a groove, which in the anterior part is depressed from one-fourth to one-half an inch. The lower part of the left thigh also shows a depression or furrow placed obliquely just above the knee. The appearances have been present from birth. The child is now 10 years old, and it was not possible to interview the practitioner who attended the confinement. According to the mother's statement, the grooves on the abdominal wall and thigh were occupied by the umbilical cord. The statement that the cord was in these grooves does not prove that they were caused by constriction of the cord. If from any cause such grooves did develop, there is a possibility that the cord might occupy them. In discussing the origin of this cause it is stated that opinion is against the view that such conditions are due to constriction by the cord, but rather to a sclerodermic lesion in which the constriction is sufficient to impair the circulation. That the cord was responsible in this case seems the more probable as the lesion of the thigh was spiral and not circular. The skin forming the floor of this groove is normal in every respect, and presents just such an appearance as one would expect from compression by a broad, smooth ligature.

THE PATHOLOGY OF PREGNANCY.

Hyperemesis Gravidarum.—E. Dirmoser³ discusses the autointoxication theory of hyperemesis, gives a full history of a case, with the effects upon animals of the injection of material taken from different organs of the patient, and believes that it was determined with certainty that the poisonous substance which caused the hyperemesis had formed itself in the intestines of the patient; that it could not be of bacterial origin, since such poisons require for their development at least the space

¹ Brit. Jour. of Obst., Dec., 1903.

² Lancet, Aug. 8, 1903.

³ Wien. klin. Woch., Apr. 2, 1903.

of 24 hours, whereas the animals experimented upon in this instance died in a much shorter time. The poison existed in abundance in the urine, also in the intestines and in the stomach, so that it must have circulated through the entire organism, and was, in the case reported, the cause of cerebral inflammation. The persistent vomiting was, in Dirmoser's opinion, only a symptom of the general disease which, at the best, on the theory of self-poisoning, will be limited in its dangerousness.

In considering the advisability of inducing labor for hyperemesis during pregnancy O. Tuszkai¹ urges conservatism until the true cause of the complaint can be ascertained. It has already been pointed out that in many cases hysteria is the direct cause of this condition, and in others an intercurrent disease, such as meningitis, gastric trouble, nervousness, or peritonitis, may be at fault. Tuszkai believes that the only cause for a true hyperemesis gravidarum, which does not disappear until pregnancy is interrupted, is to be found in a perimetritic irritation. The latter is due to an anemia of the perimetrium, brought about by the inability of the peritoneum to stretch in proportion to the increase in size of the pregnant uterus. It is essential to exclude, therefore, all other factors, especially hysteria, by the application of all possible diagnostic and therapeutic measures. The diagnosis of a pregnancy itself being at fault must be based on the following signs: Increased tendency to vomiting on local irritation, such as a bimanual examination, especially in those cases where it is known that a previous perimetritis has interfered with the elasticity of the peritoneum. Even then radical measures should not be undertaken until local treatment which endeavors to improve the circulation of the parts in question (heat or cold on the abdomen or by the vagina) has proved ineffectual and the prostration has reached a comparatively high point. The latter must be judged by the rapid decrease in body-weight, in the amount of urine voided daily, and in the number of the red blood-cells; also by the increased specific gravity of the urine, the increase in the alkalinity of the blood, and the greater frequency in the pulse-rate. If in these advanced cases large doses of opium do not help, by inhibiting the functions of the excretory organs, immediate delivery should be undertaken.

Appendicitis in Pregnancy.—Monod² notes that, according to Baptiste's statistics of 67 cases of acute appendicitis occurring during pregnancy, the mortality in 43 cases operated upon was 30 %, while in the remainder, where no operation was undertaken, it was but 11 %. The operation cases, he points out, included the worst, for when symptoms were mild, expectant treatment was nearly always adopted. Baptiste's statistics, however, show the gravity of appendicitis in pregnancy, and Monod considers that in any case where that disease has occurred the pregnant woman should be advised to have the appendix removed at once. Monod describes 3 cases of this practice which he terms *resection de l'appendice a froid*; in all the patient informed him when she consulted him for her pregnancy that she had suffered from one or more

¹ Berl. klin. Woch., 1903, vol. xl, No. 35.

² Compt. Rend. de la Soc. d'Obstet. de Gyn. et de Ped. de Paris, May, 1903.

attacks of appendicitis, and in all that the disease was in abeyance. In the first case he operated in the sixth month and he was obliged to "fish out" the appendix from behind the cecum after freeing numerous adhesions. Yet the patient carried her child to term. This patient had gone through three attacks. The second had suffered from one only, and the operation was performed in the fourth month. There was great hypertrophy of the appendix without adhesions. Delivery occurred at term. The last patient had experienced several bad attacks of appendicitis, and, becoming pregnant, desired an operation, which was done in the third month. There were free adhesions. The pregnancy was progressing very favorably 5 months after the removal of the diseased organ, when the report was read. In a fourth case Monod anticipated trouble. A woman, aged 25, had a sharp attack of appendicitis in February, 1900. In April she was married, and a fortnight later a severe attack set in. After waiting for 5 days Monod removed the appendix, which was severely diseased; its extremity lay embedded in dense adhesions which inclosed a small abscess. He operated on the principle that pregnancy would expose the patient to greater dangers. Pregnancy did not occur until late in 1901, and in June, 1902, she was delivered at term of a well-nourished male child which was reared, and, like the mother, remains in good health. Rostoffzeff¹ sums up the previous literature on this subject, and reports 12 cases under observation in a Russian hospital. In 6 the disease was circumscribed; in 6, diffused; 6 died. In 6 cases an operation was performed; 2, in both of which the disease was diffused, ended fatally; 3 unoperated cases died—all of the diffused type; 1 death was unclassified. In 4 out of 9 of the above-mentioned patients it was recorded that spontaneous abortion or premature delivery occurred; 4 cases died after the artificial induction of labor. Thus, the combination of perityphlitis and pregnancy is an exceedingly unfavorable condition. Infection having its primary seat in the vermiform appendix may extend to the placenta and cause not only abortion, but also secondary puerperal infection. The transit of the infective process to the placenta may be effected through the peritoneum (as when general peritonitis occurs), through the ligamentum appendiculo-ovaricum, or through adhesion of the uterus to a perityphlitic focus. Secondary infection of the appendix from puerperal sepsis is rare. Early operative interference is indicated when perityphlitis occurs in pregnancy. Rostoffzeff notes how very unsatisfactory are the results of inducing abortion, a practice which must be utterly rejected under these circumstances.

Typhoid During Pregnancy.—A noteworthy increase of enteric fever is recorded in Rome, especially among pregnant women. Pio Masetti² writes on the management of this complication, and reports an instance in which artificial abortion was indicated, after an alarming rise of temperature, weakness and rapidity of pulse, and uncontrollable continued vomiting. He quotes from a recent contribution to this subject by Tito Gualdi.³ Observers agree that pregnancy is no bar to typhoid infection,

¹ *Zent. f. Gynäk.*, 1903, No. 49.

² *Il Policlinico*, Rome, Oct. 10, 1903.

³ *Typhoid Fever in Rome*, Rome, 1901.

but apparently may predispose to it. Rokitansky and Niemeyer dissent; yet their views were expressed before a collation of the recent information. Until the present time little attention has been given to microorganismal infection of the fetus. However, it is known that the placenta is no effective bar. Chantemesse, Widal, and Eberth have discovered the specific bacilli in blood derived from a fetus taken from a typhoid patient. The transmission may be vascular, or may have its origin in fecal or urinary discharge at the vaginal orifice and ascent of the germ through the genital tract to where the seclusion of the fetus gives but imperfect safety. Masetti unites with Gualdi in bearing testimony to the frequency of fetal infection. Death of the fetus may occur from simple elevation of the maternal temperature or from the specific fever. Doléris and Doré find this a source of premature uterine contraction. In addition, toxic materials circulating in the blood, especially if of typhoid origin, increase the danger of abortion and relatively darken the general prognosis. Abortion takes place most frequently during the second week of the fever, and occurs in about two-thirds of the cases. Its occurrence is not necessarily of unfavorable effect on the febrile attack. After an initial rise the temperature may break. The treatment of enteric fever complicated by pregnancy will follow accepted lines, even to the regular Brand procedure. The reduction of temperature will lessen the danger of abortion, and the cold baths are of advantage in their effect on the nervous system. One constant danger of the typhoid complication is the appearance of pernicious vomiting, as in the case just quoted. When abortion occurs or is induced, extreme care must be taken to remove the entire fetal membranes. Abortion is a necessity if renal involvement supervenes, or in the event of very difficult nutrition of the patient, or the occurrence of pernicious vomiting, to which the typhoid infection seems to predispose. Finally, the general opinion as to the frequency of typhoid infection of those pregnant is determined, but Niemeyer and Rokitansky believe it is due to the lowered lymphatic and vascular resistance, and especially to a reduction in the hemoglobin.

The Kidney of Pregnancy.—Hirst¹ maintains that the nephritis of pregnancy is the associated condition, and that clinical experience has taught us that it probably is the causative condition of eclampsia. Insufficient renal activity, from every clinical expression to be obtained, stands as the determinant in the nerve-explosion represented by eclampsia. Treatment directed to the relief of the diminished and altered kidney-action constitutes to-day, as it always has, our best procedure. With excretion favored and brought up to a compensatory degree, the uterus may generally be left intact. All reasonable means that are not exhausting, having in effect the stimulation of the action of the skin and bowels, and soothing, favoring diuretics are indicated, together with a very carefully regulated diet and mode of life. [The kidney of pregnancy, according to Leyden, consists in anemia of the organ with fatty infiltration of the renal epithelium, but without inflammatory changes. Attempts have been made to account for this anemia by the vascular constriction conse-

¹ Clin. Rev., May, 1904.

quent on reflex irritation from the pelvic organs, by direct pressure of the uterus by mechanic retention of urine, etc. There is a growing tendency, however, to attribute the renal changes during pregnancy (together with certain changes in the liver) to the action of toxic metabolic products, the accumulated waste-matter of maternal and fetal metabolism. That toxic substances are often the cause of renal lesions is sufficiently well established, and, reasoning by analogy, it is easily conceivable how in pregnancy the metabolic poisons may inflict an injury on the renal tissues. At first the impairment may be slight, but prolonged action or great intensity of the poison is likely to result in more serious damage, which may finally culminate in a true nephritis. It is quite plausible, furthermore, that the auxiliary factors mentioned above contribute their share to the result, for there is no doubt that the toxemia of pregnancy is a complex condition. The possible cumulative effect of repeated pregnancies may be a matter of etiologic speculation. With the removal of the causes the renal insufficiency of pregnancy would naturally tend to subside or disappear, as we actually observe in many such instances after delivery. When, however, the renal lesion has become more pronounced, it is perfectly comprehensible that it should persist after the primary cause has been removed. As a matter of fact, it has long been noted that genuine nephritis not infrequently becomes superimposed on the kidney of pregnancy. Even Leyden, who considers the renal disturbance as merely functional, holds this opinion. But here, as so often, no fixed line exists between the functional and the organic, the interval being filled up by intermediate transitional forms.]

Diabetes in Pregnancy.—Alfred Stengel¹ discusses diabetes developing during pregnancy. A reducing substance, now known to be lactose, has long been recognized, both in the mother's urine during pregnancy and the puerperium and in that of the newborn infant. This lactosuria is not accompanied by any symptoms, and neither constitutes nor predisposes to true diabetes. The histories of the 22 cases of diabetes in pregnancy described by Matthews Duncan show that: (1) Diabetes may come on during pregnancy; (2) may occur only during pregnancy, being absent at other times; (3) may cease with the termination of pregnancy, recurring some time afterward; (4) may come on soon after parturition; (5) may not return in a pregnancy occurring after its cure; (6) pregnancy may occur during diabetes; (7) pregnancy and parturition may be apparently unaffected by diabetes; (8) pregnancy is very liable to be interrupted in its course, and probably always by the death of the fetus. Stengel has tabulated the clinical data of 27 cases of diabetes occurring in 19 women during pregnancy, but has not included those of Duncan's cases, where pregnancy complicated an already established diabetes. His table shows that diabetes occurred with slightly greater frequency in second pregnancies, but also occurred in first and any later pregnancies. Advancing age did not appear to be a predisposing cause. The symptoms, which were practically those of ordinary diabetes, were prominent in 14 out of the 19 women, and indefinite in

¹ Univ. of Penna. Med. Bull., 1903, vol. xvi, No. 8.

the remaining 5. They appeared for the most part during the early months of pregnancy. When diabetes occurred in any one pregnancy, it tended to recur in later ones. The results of the pregnancies were as follows: Thirteen out of 27 terminated normally as far as the child was concerned; at least 6 ended in abortion or miscarriage; in 7 cases the fetus was born dead; and in one a living child was born, but died shortly after birth. The mothers made normal recoveries in 17 cases, died soon after labor in 5, and in the remaining 5 died some weeks or months after delivery from diabetes or other causes. On the whole, the results for both mother and child were less frequently disastrous than has been generally supposed, and Stengel believes that, while prompt intervention is needed where there is increasing glycosuria, diaceturia, grave weakness, or rapidly increasing emaciation, careful hygienic, dietetic, and medicinal treatment should first be tried in every case.

Ischuria in Retroflexion of the Gravid Uterus.—In looking over the literature it is noticeable that a great many explanations are put forward to account for urinary retention in cases of backward displacements of the pregnant uterus, says Chas. B. Reed.¹ In this fact lies sufficient evidence that none of them entirely meets the anatomic or physiologic conditions. In one case it is assumed that the presence of the displaced cervix results in a definite anatomic change in the bladder—the formation of a valve-like fold, spur, or tongue on the posterior wall, which is so developed that the catheter meets with no opposition, while the outflow of urine is effectually prevented by the action of the valve (Zweifel). In looking over the various factors and possibilities it is possible to summarize as follows: (1) Retention of urine in retroflexioversion is not due to direct compression of the urethra or neck of the bladder, whereby the lumen is mechanically closed. (2) It must be regarded as a form of "pressure-paralysis" due to interference with the nerves supplying the bladder in some part of their course. (3) Compression of the principal motor nerve (pelvic nerve) is the most common source of retention. The part most subject to pressure is the pelvic ganglion lying near the great cervical ganglion of the uterus, although the nerve may be affected in any other part of its course, either near its distribution to the bladder or close to the sacral exit of the component fibers. (4) Compression of the sensory nerves, either in the course of the nerve or peripherally (in the bladder), may also rarely produce retention. (5) Both afferent and efferent filaments may be affected simultaneously in a given case of retention, but the order is usually consecutive. (6) Pathologic conditions of the pelvis and abdomen, which irritate the sensory fibers of the bladder, produce the so-called "irritable bladder." (7) Retention of urine postpartum and after laparotomies for tumors is due to intraabdominal pressure, weakness of the abdominal muscles from overdistention, and the dorsal decubitus.

Chorea in Pregnancy.—Wall and Andrews² have collected 40 cases of chorea occurring during pregnancy. So far as causation is concerned, the

¹ Am. Jour. Obstet., Feb., 1904.

² Jour. Obstet. and Gyn. of Brit. Emp., June, 1903.

instability of the nervous system seen in pregnancy is a factor, while rheumatism often precedes chorea. In one case of microcephalus congenital deficiency of the brain was undoubtedly a factor. Anxiety over confinement or other depressing emotion may produce chorea in a pregnant patient. In one case a pregnant woman became choreic after seeing a man attempt to cut his throat. In the 40 cases chorea occurred during the first pregnancy in 18. In 10 cases the first pregnancy was free from chorea, but chorea occurred in a later pregnancy. There was a history of previous chorea in 23 cases, and in 6 chorea recurred in subsequent pregnancies. Chorea was most apt to happen between the fourth and fifth months, and next in frequency between the second and third, fifth and sixth, and seventh and eighth months. There were 2 spontaneous abortions, and in 2 the uterus was empty. There were 5 fatal cases, and 2 of these had spontaneous abortion. It is believed that the importance of insanity as inducing chorea has been much exaggerated. It is also observed that chorea does not necessarily tend to recur in subsequent pregnancies. The treatment of chorea during pregnancy consists chiefly in good nursing, full feeding, and in securing quiet and sleep. Cause for worry must be removed. Light massage is often useful. Large doses of bromid are very injurious. Alcohol is decidedly of value, and if a sedative must be employed, chloral hydrate or chloral-amid is probably best. The induction of abortion should be very seldom practised.

Central Paralysis of Pregnancy.—Paralysis of a hysteric nature during pregnancy is less frequent than is generally assumed; in most cases R. V. Hosslin¹ found a definite organic basis. Genuine apoplexy is not uncommon immediately before, during, and after parturition, and is ascribed to hypertrophy of the heart, increased resistance in the vessels of the lower extremity, and toxic influences which alter the vessel-walls. As a rule, the hemorrhage is very large and involves the central ganglions, lateral ventricles, and internal capsules, so that the prognosis is very doubtful. The onset is sudden, with coma, hemiplegia, and paralysis of the facial and hypoglossal nerves. Another form of paralysis depends upon nephritis, and is a manifestation of uremia; it generally occurs in primiparas of advanced years, and depends upon a circumscribed edema of the brain or upon hemorrhage. Prodromal symptoms, such as headache, nausea, vomiting, with or without edema and albuminuria, are common, and the paralysis generally sets in after one or more eclamptic seizures. On account of the deep coma the paralysis is often overlooked, but may manifest itself as hemiplegia, monoplegia, hemianopsia, or amaurosis; when dependent on edema, it is often transient, though the patient may still die after considerable improvement has set in. These cases are often wrongly looked upon as hysteric, since of such short duration. A large percentage of paralyzes depends upon thrombosis of the cerebral vessels, owing to puerperal infection or severe metrorrhagia after birth or miscarriage. The onset is very gradual, consciousness is generally preserved, and rapid improvement may follow.

¹ Münch. med. Woch., Mar. 8, 1904.

Convulsions frequently accompany the paralytic stroke, which is hemiplegic in type. The cause of cerebral embolism may rarely be a thrombus which is carried from a pelvic inflammation or a phlegmasia alba dolens through an open foramen ovale into the cerebral circulation; in most cases, however, it is an ulcerous endocarditis during the puerperium. It is common for old valvular lesions to recur during pregnancy, but endocarditis may also develop during this time, very insidiously, with palpitation, dyspnea, and a blowing systolic murmur at the apex. The onset and course of the paralysis are similar to those depending on thrombosis. Rare conditions which cause paralysis are cerebral tumors, puerperal encephalitis, metastatic cerebral abscess after puerperal fever, and progressive paralysis. Spinal lesions are of less importance, since most have already existed before and are hardly influenced by pregnancy. There is a distinct connection, however, between the latter and traumatic paraplegia and compression-myelitis, and occasionally a severe paraplegia will set in after copious hemorrhage. Less frequent conditions are meningomyelitis, spinal apoplexy, encephalomyelitis, acute and subacute poliomyelitis, multiple sclerosis, and a chronic form of myelitis running the course of a spastic paraplegia; it is without doubt that any one of these diseases may develop during pregnancy in hitherto healthy women, so that the cause must be ascribed to some autointoxication. Both animal experiments and clinical experience show that conception is not impossible when severe cerebral or spinal lesions are present. With cerebral disease, pregnancy usually runs its normal course if the life of the mother is not destroyed; with spinal disease, the patient is often unconscious of her condition, and pregnancy may be interrupted when the disease sets in suddenly. Even parturition is hardly affected by cerebral paralysis, and in the spinal forms the labor pains are usually of normal intensity. In many cases the delivery is easier and more rapid than in normal individuals.

Pregnancy and Dermoids of Both Ovaries.—[The recent discussion in the London Obstetrical Society on pregnancy after more or less mutilation of the tubes and ovaries will remind us that prognosis as to sterility or fertility after operations in which such mutilation is unavoidable must be very guarded.] Condamin¹ (Lyons) has published an interesting summary of instances of pregnancy in patients subject to bilateral dermoid ovarian tumors already of large size. This phenomenon shows that when the two ovaries (in the anatomic sense of the term) are converted into dermoid cysts, pregnancy may nevertheless occur. Follicles bearing ova probably remain in the outer wall of the tumors and manage to enter the ostium of the fallopian tube; it is also evident that spermatozoa must somehow reach the ova. But, as was suggested in the discussion above alluded to, it is possible that in some of these cases there was ovarian tissue beyond the limits of the anatomic ovary—probably in the ovarian ligament; this would explain how in many of the cases collected by Condamin, though the pair of dermoids, very small as tumors, were apparently destitute of any trace of ovarian tissue,

¹ Ann. de Gyn. et d'Obstét., Mar., 1904, p. 188.

yet the patient had borne children to within a short time before the operation. In 9 cases of an opposite type a brace of large dermoids was removed during pregnancy. On reflecting on these instances of conditions widely different as to the degree of development of the pair of dermoids, we may reasonably suspect that not rarely the destruction of true ovarian tissue within the limits of the ovary proper occurs very early, so that pregnancy in double incipient dermoid disease takes place in the same way as when the tumors have become large—that is to say, the ova do not come from either of the diseased ovaries. It cannot be denied, on the other hand, that true ovarian tissue exists in some cases within the limits of a dermoid ovary, and on that fact rests a question of grave importance to the surgeon. In 4 cases the operator, when removing the pair of dermoids, left a small fragment of the ovary and had the satisfaction of learning that the patient became pregnant again after recovery. Condamin expresses doubt as to whether it is always possible to preserve a portion of normal ovary. It is certainly not always possible, but it is also doubtful whether it is ever advisable. It would be interesting to know whether recurrence occurred in any of the 4 cases in which a piece of ovary was designedly left behind. The relief felt by a patient after convalescence from ovariectomy is extreme, but the disappointment and mental suffering should recurrence occur are correspondingly great: hence it is questionable if it is right to incur the risks of recurrence even for so high an aim as the securing to the patient a chance of maternity.

Management of Pregnancy Complicated with Uterine Fibroids.—Routh¹ says that danger arises from cases being improperly treated, or not treated at all, but when complications are treated efficiently by modern surgical and antiseptic methods, the mortality is enormously reduced, the chief dangers being: (1) *During pregnancy*—rapid enlargement of the fibroids, degeneration of the fibroids, abortion, with hemorrhage and sepsis. (2) *During parturition*—fetal malpresentations, obstruction, hemorrhage. (3) *During the puerperium*—degeneration or extrusion of a submucous fibroid, sepsis, and secondary infection of the fibroids. The effect of pregnancy upon fibroids is discussed under the following heads: (a) Growth of fibroids during pregnancy. Routh is not at all certain that fibroids do, as a rule, increase much in size in pregnancy. (b) Atrophy of fibroids during involution of the uterus. They may atrophy and disappear entirely during involution of the uterus. (c) Degeneration and extrusion of submucous fibroids after labor. Occasionally after labor a submucous fibroid will degenerate and be extruded without harm. Usually, however, necrosis of the fibroid occurs during the somewhat prolonged period of extrusion, and sapremia or septicemia may result. (d) Secondary infection of fibroids during the puerperium. Infection of fibroids during the puerperium may occur, and fatal peritonitis may result, as the softening during pregnancy renders them very liable to infection. The effects of fibroids upon a coexisting pregnancy are discussed under the following heads: (a) Do fibroids

¹ Brit. Med. Jour., Oct. 3, 1903.

cause sterility? It is generally believed that they do, but he says it is not probable that fibroids are not by any means a frequent cause of sterility, but that it is possibly more true that sterility is a cause of fibroids. (b) Probably fibroids do not predispose to abortion or premature labor, as statistics seem to prove that the proportion of abortions with fibroids is very little greater than the normal average. (c) Fibroids undoubtedly cause fetal malpositions. (d) Fibroids lead to uterine inertia and delayed labor; also postpartum hemorrhage and adherent placenta are more frequent than in normal labor. (e) Existing fibroids may cause obstruction during labor, but spontaneous elevation of the fibroid out of the pelvis is more likely to take place late in pregnancy or even in labor. Cervical and intraligamentous fibroids are incapable of being elevated. (f) Involution in the puerperium is retarded, but not impaired. The lochia is increased and persists longer. In treatment before fetal viability attempts should be made to elevate the fibroid by digital or hydrostatic pressure in the Sims or knee-chest posture. Forceful reposition is to be avoided. Induction of abortion has been abandoned. Myomectomy is now the ideal indication for treatment when pressure-symptoms develop before fetal viability, but it can be hopefully undertaken only in a small number of cases. Hysterectomy is the procedure when there is real danger in allowing the patient to go on to term, or when the pressure-symptoms are serious and the fibroids are multiple and too deeply embedded; also for intractable hemorrhage. In treatment after fetal viability the indication is to avoid interfering so long as the mother's life is not endangered. Reposition may be tried. No attempt should be made to drag the child, living or mutilated, past an obstructing fibroid of any size by forceps or by version. If the patient is in labor and the obstructing fibroid shows no tendency to rise, or if it is fixed in the pelvis, an operation is inevitable, and, except in the case of a cervical fibroid, abdominal section is necessary, for symphysiotomy is condemned by all in these cases. Cervical fibroids cannot be elevated, but in some cases they may be enucleated from below. In treatment after labor hysterectomy may be required, in cases in which labor has already taken place in fibroid uteruses, for postpartum hemorrhage, or uterine sepsis with infected fibroids with retained placenta.

PLACENTA PRÆVIA.

Hammer¹ reports 107 cases of placenta prævia from the Wurzburg Clinic—19 cases of central insertion, 70 of lateral insertion, and 18 of deep-seated placenta. The total mortality among the mothers was 8, or 7.47 %, while the fetal mortality was 58, or 54.2 %. In cases of placenta prævia centralis Hicks' method of combined version was performed in 14 instances, with 13 maternal recoveries and with 3 living children. In lateral placenta prævia combined version was performed 40 times, with 34 maternal and 13 fetal recoveries. In breech-presentations slow extraction was followed 8 times, with 7 fetal deaths. Arti-

¹ N. Y. Med. Jour., Oct. 17, 1903.

ficial rupture of the membranes was practised 11 times, with 10 fetal deaths. Perforation was necessary but once. In 2 cases metreuryesis was done, saving both mother and child. The mortality for both mother and child was lower in cases of deep-seated placenta prævia when rupture of the membranes was the treatment followed. Hammer calls attention to the impossibility of always being able to perform combined external and internal version without the aid of anesthesia.

Prolapse of the Placenta from Its Normal Situation.—Kayser¹ reviews extensively the literature of this subject. He finds in the records of the clinic at Dresden no case of prolapse of the placenta recorded in 22,000 births. In the clinic at the Charité there was recorded no case in 42,800 births. On examining the records, a case of version with bleeding is described which must have been a prolapse of the placenta. A few cases collected from the literature are quoted in which this accident happened. His own case was that of a multipara, aged 33 years, who had a considerably contracted pelvis. Eight hours after the rupture of the membranes, the head presenting, the fetal heart-sounds became much less frequent. On examination the placenta was found presenting at the internal os, although formerly it could not be discovered. There was slight hemorrhage. Prolapse of the placenta was diagnosed and version was performed, which was accompanied by a slight discharge of blood. The fetus was not extracted, but was allowed to remain in the uterus in the hope that labor-pains would come on. Fifteen hours after the performance of version the patient was found in collapse and shock. The cervix was incised. The body of the child was delivered with difficulty, and the head was delivered by craniotomy. The patient died during the operation. Upon autopsy the attachment of the placenta was found to have been at the fundus of the uterus. A transverse rupture of the uterus was found on the anterior wall of the cervix, while upon the right side was discovered a dermoid cyst. It was Kayser's belief that the rupture of the uterus occurred while an assistant made strong pressure upon the after-coming head in an effort to press it downward into the pelvis. From the cases reported and from his own Kayser deduces the following conclusions: In the presence of prolapse of the placenta with hemorrhage delivery is imperative. A high degree of pelvic contraction forbids the performance of version. Embryotomy is usually indicated. If hemorrhage is absent and the child is living, an effort should be made to save its life. Delivery should then be conducted in the manner least dangerous for mother and child. If the child is dead and the pelvic measurements are normal, immediate interference is unnecessary.

Accidental Hemorrhage in Pregnant Women.—Briggs² claims that there is a *prima facie* case for reconsideration of what the treatment should be. By a detailed review of the literature of the past, including the essay of Rigby and the statistics of Sir James Simpson, he shows the high mortality which occurs in cases of placenta prævia when podalic version is practised by famous obstetricians. Better results have followed the adoption of gentler and more precise methods, such as external

¹ Arch. f. Gyn., 1903, Bd. lxx, Heft 3.

² Brit. Med. Jour., Jan. 2, 1904.

version and the use of the bag of Champetier de Ribes, as less rapid and more natural delivery is effected. It was doubtful, however, whether in the treatment of severe accidental hemorrhage equal improvement had occurred. The literature of this subject was also brought under review, and in conclusion Briggs drew attention to the Rotunda Hospital method of treatment by pressure effected by the binder, vaginal tampon, and perineal bandage, which seemed to be effectual in that most difficult class of cases in which, with accidental hemorrhage, the os was closed, no pains present, and the patient suffering from shock, but still possessing a chance of recovery. In the hands of Smyly and his followers the treatment of this alarming complication had been of a more encouraging character than formerly, and he thought that the method, which he had himself tried in his own practice, should be adopted generally. Walls considered the term "accidental hemorrhage" a misnomer, and in some measure responsible for unsatisfactory treatment. The cases should be regarded as influenced by some toxemia of pregnancy, for the patients almost invariably expressed themselves as "never having been well" during pregnancy; and in many cases the urine was loaded with albumin. He considered that many cases might be suspected beforehand and treated on general lines appropriate to the toxemia, taking the urine as guide, and improving the action of the bowels, kidneys, and skin. The three great indications which guided his practice were to improve the patient's condition by quiet, rest, food, stimulation, and warmth, and to encourage the uterus to overcome its inertia by friction, the binder, and a vaginal plug or Champetier de Ribes bag; in the absence of proper uterine action he condemned the practice of rupturing the membranes. The second indication was to deliver the patient if improvement ceased to follow the preliminary treatment; and, thirdly, to guard especially against postpartum inertia and hemorrhage. Sinclair thought true cases of accidental hemorrhage were extremely rare, not more than 1 in 10,000, but when it did occur, energetic interference and treatment were demanded, and accouchement forcé should be adopted. Fothergill explained the rationale of the Dublin treatment of accidental hemorrhage. A healthy uterus could not be distended to more than a certain extent; therefore if escape of blood from the cervix could be prevented by vaginal plugging, the tension within the uterus would soon equal the blood-pressure, and, according to the Dublin school, bleeding would cease. In a diseased uterus, however, distention could go much further, and practically all the blood in the body might empty into it. In really serious cases, perhaps, abdominal section gave the patient the best chance. P. R. Cooper thought that cases of severe accidental hemorrhage were not so rare, but that they might occur in the practice of any practitioner. He considered the essential guide to correct treatment was the condition of the uterine muscle. When this was active or responded to stimulation, expediting delivery by the ordinary methods would probably answer best. When, however, the uterus was completely inactive and irresponsive, forcible extraction was absolutely contraindicated. In these cases a Porro operation probably gave the patient the best, if not the only, chance of recovery.

The Bossi Dilator.—[The literature upon the use of this dangerous instrument is remarkably scanty, and that which does appear abounds with warnings of the dangers to be anticipated during its employment.] This is true of the able review by T. Wilson,¹ who finishes his paper as follows: "The conclusion seems to be justified that, while Bossi's dilator is likely to be used for a time by some obstetricians, the majority will prefer a less cumbersome and less expensive apparatus, which at the same time offers at least equal safety and advantage to the parturient woman. Finally, we may always with advantage bear in mind the warning of Nagel: 'The occasional appearance and disappearance of dilators should warn against optimism.'"

An Improved Metranoikter.—B. C. Hirst² remarks as follows: "Although Schatz presented his metranoikter at a meeting of the Leipsic Obstetrical Society as long ago as the autumn of 1881, it has apparently found little favor in his own country, and is scarcely known elsewhere. It is not mentioned in the index of Veit's 'Handbuch,' and is dismissed in a paragraph in the 'Encyclopädie der Geburtshülfe und der Gynäkologie' by a writer who disapproves of it. My attention was called to the instrument by an article by Daniel and Schneidersievers, who recommended it highly. In a number of cases in my hospital service this winter I have found that the dilator accomplished all that its inventor and advocates claim for it, but as the four-branch principle has proved its superiority in all metal dilators for the cervix, I had an instrument-maker construct a dilator on the Schatz model, but with four instead of two blades. (See Fig. 37.) With this instrument a wider and more permanent dilation of the cervix can be secured than with any other that I know of. If the dilation is performed for dysmenorrhea and sterility, I have used—(1) A Baer's modification of Goodell's dilator; (2) a heavy Wathen's dilator; (3) the four-branched Cleveland dilator; then have curetted



Fig. 37.—Hirst's modification of Schatz's metranoikter.

¹ Birmingham Med. Rev., July, 1903.

² Amer. Med., June 4, 1904.

the uterus, washed out the cavity, inserted the metranoikter, and packed the vagina with sterile gauze. The metranoikter remains in the uterus 24 hours. If the instrument is used for diagnostic purposes, only enough dilation is secured with a light dilator to permit its insertion. In multiparas no preliminary dilation at all may be required. At the end of 24 hours, when the metranoikter is withdrawn, it is possible to insert the forefinger to the fundus uteri, and to palpate with perfect ease the whole uterine cavity. The metranoikter does more than uterine tents can do, without danger of infection and without pain.

Cesarean Section for Placenta Prævia.—In treating this subject with special reference to the life of the child, F. D. Donoghue¹ says that the conservative Sænger-Cesarean section should be performed in cases of—(1) Complete placenta prævia; (2) placenta prævia in primiparas in the absence of severe hemorrhage or rigid os; (3) when there is a history of previous operative delivery; (4) it should be considered in all cases in which version is indicated, if a reasonably skilled surgeon is available and only an ordinary obstetrician; (5) all these indications are based on a probable viable child—28 weeks of gestation and upward. Finally, it is urged that—(a) the operation should be performed through the left rectus muscle; (b) incision of the uterus is not usually followed by hemorrhage, even when the broad ligaments are not constricted; (c) time should be allowed for contraction and retraction of the uterine fibers before the placenta is removed; (d) if sufficient time is allowed for this to take place, no blood will be lost from the beginning to the end of the operation, and if severe hemorrhage has preceded the operation, the abdomen can be filled with saline solution before it is closed; (e) the shock of such an operation is certainly not greater than that of version or forceps in a woman already exhausted; and (f) within a few minutes of starting, the indications of treatment—namely, to empty the uterus and control the hemorrhage—will have been fulfilled. H. D. Fry² remarks that the mortality from cesarean section has also been greatly reduced by modern methods, and the decision in regard to its use in placenta prævia must rest upon the selection of the operation to meet certain combinations of conditions. If the position of the placenta is only partial insertion over the os and the cervix is soft and dilatable, it is undoubtedly best to deliver by the natural passages. If, however, the woman is in good condition and is not exhausted by prolonged labor and hemorrhage; if the placenta is implanted centrally, or nearly so, and the cervix is undilated and undilatable, as is frequently found in primiparas, cesarean section, when performed under the best conditions, is not only justifiable, but undoubtedly gives the least mortality to the mother and greatly lessens the dangers to the child.

EXTRAUTERINE PREGNANCY.

Cases of ectopic pregnancy of unusual interest are recorded as follows: Amann,³ a full-term extrauterine fetus retained for 5 years in the abdominal

¹ Ann. of Gyn. and Pediat., Aug., 1903.

² Maryland Med. Jour., July, 1903.

³ L'Obstet., July, 1903.

cavity; it was rolled into a ball, and showed several malformations, in addition to being partially calcified. Malcolm,¹ an advanced case with removal of a living fetus by section, the fetus shortly perishing; the placenta was adherent over the right side of the pelvis nearly as high as the brim, over a portion of the left side of the sacrum and the left side



Fig. 38.—Left ovary and fallopian tube, showing ruptured gestation-sac close to uterine end of the tube (Duncan, in *Lancet*, Feb. 27, 1904).

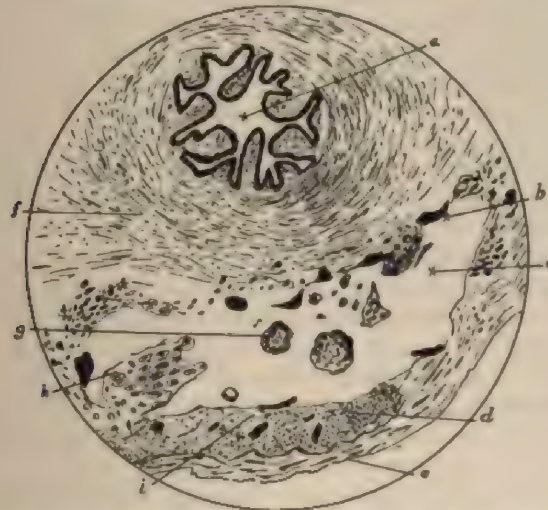


Fig. 39.—Transverse section of pregnant tube, showing that the gestation-sac is outside the lumen of the tube ($\times 75$): *a*, Fallopian tube; *b*, syncytial mass; *c*, gestation cavity; *d*, blood-spaces in walls of cavity; *e*, remains of tube wall and peritoneum; *f*, muscular wall of tube; *g*, villus; *h*, mass of large chorionic cells; and *i*, syncytial mass (Duncan, in *Lancet*, Feb. 27, 1904).

of the pelvic floor; it was allowed to remain, each dressing being followed by hemorrhage; recovery was complete. Lockyer,² a fatal case in which the ovum continued to grow about 4 weeks after rupture, becoming implanted on the omentum, and remaining alive until it passed

¹ *Jour. of Obstet. and Gyn. of Brit. Emp.*, Nov., 1903.

² *Ibid.*, Nov., 1903.

through a large tear in the secondary gestation-sac. Czyzewicz¹ and J. Oliver,² each a case of full-term ectopic pregnancy; in Czyzewicz's case the child, though small, was well developed and lived. Jurinka³ and Kiparski,⁴ each a case of pregnancy in bicornute uteruses. W. L. Wallace,⁵ Mainzer,⁶ and Sippel,⁷ each a case of interstitial pregnancy, all 3 of the patients recovering. W. Duncan,⁸ a case in which rupture occurred on the nineteenth day after conception and 10 days after the uterus had been curetted; the accompanying illustrations (Figs. 38, 39) show the site of the sac and its microscopic features; the gestation-sac lay outside the lumen of the tube, and Duncan claims that the embryo always burrows through the epithelial lining of the tube into the muscular coat, where it develops. [Beckman divides cases of interstitial gestation into 2 groups: (1) *Tubouterine*, in which the communication with the uterine cavity persists, resulting in early abortion into the uterus; and (2) *true interstitial*, in which the ectopic gestation is separated from the uterine cavity by a muscular septum and the sac ruptures into the peritoneal cavity or uterus.]

Cases of recurrent extrauterine pregnancy are reported by Reifferscheid,⁹ F. F. Lawrence,¹⁰ E. Ullmann,¹¹ Cohn,¹² and P. A. Harris.¹³ Cases of **double extrauterine pregnancy** are reported by S. Chandler¹⁴ and Jayle and Naudrot;¹⁵ the writers collect 29 instances of this condition and state that the patient is usually a multipara. Cases of **coexisting extrauterine and intrauterine pregnancy** are recorded by Mainzer,¹⁶ the extrauterine fetation being of the interstitial variety; Simpson,¹⁷ J. H. Galton,¹⁸ the patient dying on the seventh day; C. A. Stillwagen,¹⁹ the patient dying 67 days after operation; and Marshall.²⁰ Simpson tabulates 113 cases of this condition, with full references. Cases of **twin tubal pregnancies** are reported by Senator²¹ and Lucas-Championniere.²²

Ovarian Pregnancy.—[Of the extrauterine pregnancies, those of the ovarian variety are comparatively rare, and Schrenck found in 610 cases of extrauterine pregnancy but 4.6 % of ovarian cases.] G. I. Olechno²³ describes an interesting case of a woman, a primipara, aged 25 years, who asked for admission to the hospital because of a severe hemorrhage of 3 weeks' duration. Examination of the abdomen elicited a somewhat tender swelling, the dimensions of which could not be clearly made out on account of the woman's greatly developed adiposity. The uterus was in its normal position, and the size of a lemon, soft, and admitting

¹ Zent. f. Gynäk., 1904, No. 4.

² Zent. f. Gynäk., 1903, No. 45.

³ Amer. Med., Mar. 12, 1904.

⁴ Ibid., Dec., 1903.

⁵ Zent. f. Gynäk., 1903, No. 12.

⁶ Wien. med. Woch., Jan. 2, 1904.

⁷ Med. Rec., Apr. 23, 1904.

⁸ Rev. de Gyn. et de Chir. Abd., March-April, 1904.

⁹ Zent. f. Gynäk., 1903, No. 20.

¹⁰ Lancet, Sept. 12, 1903.

¹¹ Jour. of Obstet. and Gyn. of Brit. Emp., Nov., 1903.

¹² Monats. f. Geb. u. Gyn., Oct., 1903.

¹³ Rev. de Gyn. et de Chir. Abd., July-August, 1903.

¹⁴ Roussky Vrach, Oct. 25, 1903.

¹⁵ Lancet, May 23, 1903.

¹⁶ Monats. f. Geb. u. Gyn., Nov., 1903.

¹⁷ Monats. f. Geb. u. Gyn., July, 1903.

¹⁸ Lancet, Feb. 27, 1904.

¹⁹ Jour. Am. Med. Assoc., Feb. 20, 1904.

²⁰ Zent. f. Gynäk., 1903, No. 29.

²¹ N. Y. Med. Jour., Aug. 15, 1903.

²² Am. Jour. Obstet., Mar., 1904.

²³ Jour. Am. Med. Assoc., Mar. 19, 1904.

freely a sound for 14 cm. The tubes were felt slightly enlarged; to the left and behind the uterus was a movable, slightly tender swelling, the size of the fist. A diagnosis of extrauterine pregnancy was made, and a laparotomy was performed. A dark-red tumor, somewhat adherent to the broad ligament, was found in Douglas' culdesac. The left tube was seen at its entire length, its fimbriated extremity grown to the antero-superior portion of the swelling. This last was separated from the surrounding adhesions and removed. As the right tube was also found to have undergone some changes, part of it was excised, the culdesac was cleared of the clots, the wound closed, and a sterilized tampon placed in the vagina. Recovery was uneventful. The tumor contained a fetus with clearly demonstrable extremities. Its upper wall contained a hard body, which in its consistence and form felt like an ovary. The ovarian ligaments were not evident. With the pregnancy there was also a right hematosalpinx which escaped the notice of the examiner before the operation.

Ectopic Gestation: Its Etiology, Diagnosis, Symptomatology, and Treatment.—[Extrauterine gestation has been the subject of numerous publications during the past year. Our knowledge of the changes that occur in the wall of the pregnant tube and also of the manner in which rupture of the tube is produced is much more complete than it was.] The anatomy of the pregnant tube was fully considered in a paper published by J. R. Andrews,¹ and the whole question formed one of the subjects of discussion at the meeting of the German Gynecological Society in June of this year (1903). [It is becoming more and more evident that the ovum in cases of tubal pregnancy is embedded beneath the mucous membrane of the tube and is not simply attached to its surface. The free pole of the ovum—that is to say, the part projecting toward the lumen of the tube—is covered by a true decidua reflexa or by organized clot, or by some of the folds of the mucous membrane representing such a decidua. The development of the tubal decidua is a constant condition, although the amount of its development varies considerably in different cases. In cases of tubal rupture the wall of the tube gives way, while in cases of early tubal abortion the covering of the free pole of the ovum becomes torn through. The part played by the epithelium of the villi in causing the destruction of the muscular tissue of the wall of the tube is not yet completely determined, but no doubt it plays an important part. The occurrence of a primary abdominal gestation cannot yet be said to have been demonstrated beyond doubt, but the existence of ovarian gestation is now accepted by all observers. With regard to the question of treatment in accordance with the conservative tendency of recent gynecologic surgery, it is becoming more and more the custom with many obstetricians to adopt expectant treatment in the case of a limited peritubal hematocele due to tubal abortion and to operate in practically all other cases of this kind, while the abdominal route is more generally applicable and more often employed than the vaginal.]

A work of much interest has been published by F. von Winckel,² on the

¹ *Lancet*, Dec. 26, 1903.

² *Lancet*, Dec. 26, 1903.

deformities of the fetus in cases of ectopic gestation. He draws the conclusion that maldevelopments of the fetus are much more common than is usually believed, and occur in some 50 % of the cases. He thinks that the contractions of the fetal sac, which are often well marked, play an important part in producing these deformities and diseases of the ectopically developed fetus. It is interesting to notice that such deformities often disappear spontaneously if the fetus continues to live.

Opitz,¹ from a study of 23 specimens of tubal gestation, reaches the conclusion that the cause of arrest of the impregnated ovum in the tube is the presence in the latter of a culdesac formed by the adhesion of neighboring folds of mucous membrane, the result of previous attacks of salpingitis. These false cavities were found in every specimen examined by numerous serial sections. [This explanation has not been offered by any previous observer.] Based on a series of 233 cases observed at the Charité in Berlin, E. Runge² presents the following views as to the etiology, pathology, and treatment of this condition. He thinks that the main etiologic factor in the production of a tubal pregnancy is a chronic gonorrhea or a puerperium which has run a pathologic course. Nulliparas do not prove an exception to the process, however. A tubal pregnancy is often preceded by a period of greater or less sterility. Tubal abortions and rupture occur most commonly during the first 3 months of pregnancy. Operative interference need be considered only—(1) When symptoms dangerous to life are present; (2) when there is a distinct increase in the size of the tumor; (3) when the general condition is getting worse or a resorption of the tumor does not take place; (4) when the temperature continues high. The best operative procedure is laparotomy, and drainage of the abdominal cavity should not be practised. Unless disintegration of the coagulated masses of blood has taken place, only those which can be readily reached should be removed. Interference should not be postponed until the fetus has reached a viable age. When hematoceles are present, they should be treated in a conservative manner. Operation is indicated only by particular conditions, and should be done by means of a posterior vaginal section. Laparotomy should be reserved for those cases in which the tumor is very large or difficult of approach by the vaginal route. Kober³ concludes from his investigations of the subject that it is impossible to assert that all cases of hematocele result from ectopic gestation. Wherever it is possible to recognize fetal tissue, the diagnosis is plain. The histologic examination is often difficult, and occasionally the positive result cannot be obtained. It is often more the result of good fortune than of the method of examination that the fetal tissue is detected.

The Cervix in Ectopic Gestation.—Pinard⁴ gives his valuable opinion on this subject. He finds that the modification of the cervix uteri in extrauterine pregnancy is not properly interpreted. In reports we read "cervix small, firm, not softened." These words mislead many

¹ Zeit. f. Geb. u. Gyn., 1903, Bd. xlviii, Heft 1.

² Arch. f. Gyn., 1903, vol. lxx, No. 3.

³ Zent. f. Gynak., 1903, No. 22.

⁴ Compt. Rend. de la Soc. d'Obstet. de Gyn. et de Ped., June, 1903.

students and gynecologists. The cervix always becomes softer in pregnancy, whether normal or extrauterine, but it must not be forgotten that the softening process passes away when the ovum dies. Very often when ectopic gestation is diagnosed, that condition exists, clinically speaking, but the fetus has been for some time dead. The cervix in such a case is firm, for, obstetrically speaking, there is no pregnancy—nothing but a fetal sac. Pinard notes that when an extrauterine pregnancy has gone on to term, the cervix uteri may be so soft that an experienced obstetrician may suspect that the gestation must be normal after all.

Tubal Abortion.—[It may be admitted that the profession is now in fair possession of the facts related to the pathology of extrauterine gestation. The symptomatology, however, and, above all, certain details of the treatment, are still largely in need of elucidation, and an experience of more than 18 cases, as reported by M. Storer,¹ is well worthy of attention.] Storer has had an especially valuable experience with tubal abortions, inasmuch as this condition, ordinarily considered so rare, occurred in 56 % of his cases. The symptoms which he found of chief importance in this condition were pain and anomalous escape of blood from the uterus. This pain is characteristic, yet ordinarily not severe enough to bring the patient to a doctor. It is quite different from that of ordinary menstruation—short-lived, stabbing, not colicky, and not comparable in severity with the pain of a tubal rupture. The subsequent metrorrhagia ordinarily excites the suspicion of the patient, which is confirmed by a vaginal examination. As regards tubal abortion or rupture, Storer states that the characteristic symptoms, contrary to general belief, occur before the eighth week. The question of treatment resolves itself into one of operation; he advises that this should always be as early as possible after diagnosis. As to the cause of tubal abortion, Marshall² says that the glandless tubal mucosa hypertrophies only slightly and does not form a decidua, such as is found in the uterus. The trophoblast and chorionic villi of the growing ovum readily perforate this thin layer and open into the enlarged tubal vessels. This gives rise to hemorrhage, which partially or completely separates the ovum, and ends, in the majority of cases, in an incomplete or complete tubal abortion between the fourth and twelfth weeks. As to the cause of tubal rupture, the tube might rupture spontaneously as the result of perforation of the wall by the growing villi, from sudden distention by hemorrhage, or from violence.

Veit³ attributes the severe hemorrhage into the abdominal cavity in a case of ruptured tubal pregnancy to the deportation of villi. If a vein beneath the peritoneum becomes filled with villi, the blood-current is arrested and the vein ruptures. When the rupture occurs, the resistance at this point is less and the blood pours freely in this direction. The ovum is detached as a result of the stagnation of the blood-current, and blood also escapes from the point where it has been attached. In abortion in the uterus the contraction of the walls tends to arrest the

¹ Boston M. and S. Jour., Jan. 7, 1904.

² Lancet, Mar. 26, 1904.

³ Jour. Am. Med. Assoc., July 25, 1903.

bleeding, but there is no contraction in tubal abortion, and the hemorrhage continues unchecked. He maintains the possibility of tubal abortion—that is, violent hemorrhage into the abdominal cavity without rupture. He prefers incision to exploratory puncture, and operates when the fetus is still in the tube, but if it has escaped from the tube, he waits as long as possible. If impossible to distinguish, he is guided by the severity of the symptoms. The ideal course is the complete extirpation of the fetal sac. In case of suppuration, however, it is certainly better to suture it in. He chooses the vaginal route only in case of fever, and then only incises the sac. Werth, he notes, thinks that the results of active and of conservative treatment about balance. In conclusion, Veit makes an earnest plea for stricter concentration of research in the domain of ectopic pregnancy, and the restriction of the literary overproduction which is spreading over wide surfaces without going deep. This overproduction renders it more and more difficult for one to keep posted on the subject, and is a direct hindrance to scientific progress, for in the overwhelming mass of long-established facts which are simply brought forward and published over and over again the really new and important results of original research are easily overlooked by those especially interested in the subject. Jung (Greifswald) does not agree with Veit that it is best to wait if the fetus is dead, and operate only on renewal of symptoms. The conditions in the latter case are much less favorable for an operation. Long-continued absorption impairs the working capacity, and the case frequently terminates in perimetritis. In his 86 cases he operated through the abdomen in 43, and through the vagina in the same number, with 2 deaths in each category. He always operates unless particularly favorable external conditions exist or there is reason to expect rapid absorption. He always strives to leave as much as possible of the tube or insure the permeability of the other.

Pelvic Hematocele.—[Formerly considered to be a very rare condition, the trend of modern thought is toward the opinion of an almost constant relation between ectopic gestation and pelvic hematocele.] J. H. Stealy¹ believes that the trouble lies chiefly in the different views on the relation between these two troubles. If most of the blood-extravasa-tions in the pelvis are to be considered to be the effects of tubal pregnancy, then, indeed, the cases will be found to be very numerous. The only right that we have to call a pelvic hematocele a result of an extra-uterine pregnancy is the absolute identification of decidual cells or chorionic villi, or the presence of a fetus. In a disappointingly large number of women it is impossible to get any suggestive history that might help us in solving the problem of etiology. And in the consideration of the question Stealy assumes as facts, *a priori*, that: (a) Impregnation normally occurs in the fimbrias of the tubes, as shown by Strassman, Mandl, Hofmeier, Heusen, and others; (b) the ciliary currents are downward from the fimbrias to the cervix, as stated by Kelly; (c) the denudation of the epithelium of the uterus or the tubes is not necessary to the implantation of an ovum (Dudley). The more the subject is re-

¹ Am. Gyn., May, 1903.

viewed, the more evident is the fact that we can lay at the door of no cause the fault of this condition. Broadly stated, any condition which absolutely prevents the egress of the impregnated ovum from the tube, or delays its passage until, by its rapid growth, it has become too large and heavy to be moved by the action of the cilia and the peristalsis of the tube, is a condition favoring tubal pregnancy. These conditions may be extrinsic or intrinsic or acquired or inherited. The woman may have all the signs of pregnancy except the absence of her menses, and this should put us on our guard; or she may state that her menses had stopped for a month or so, and that she considered herself pregnant, when, upon the reestablishment of the flow, she believed herself mistaken. The symptoms of tubal rupture and abortion are those of pelvic hematocoele, and consist of all the evidences of severe internal hemorrhage and shock. When the rupture is into the cellular tissue of the broad ligament, the pain and shock will be intense. If a small vessel alone is lacerated, the fetus may die and the patient go on in perfect health with a diagnosis of colic. In general, we may say that the etiology, signs, symptoms, and treatment are as follows: Cases of ectopic gestation are by no means infrequent, and are among the most serious conditions with which we have to cope. Generally they occur in those near middle life, having a previous history of sterility. The symptoms that are to be carried in mind are: (1) The woman will have missed a period; (2) colicky pains; (3) bloody discharge from the vagina or an irregular continuation of menstruation, often leading the woman to believe herself pregnant. With few exceptions—and these are dependent only on the woman's welfare—the indication for immediate operation in these cases is absolute. No case of "colic" in a woman capable of procreation, more especially one married, should be allowed to pass unscrutinized without the thought of ectopic gestation in mind; and to be emphasized a thousandfold is that no such symptom in a pregnant woman should be lightly regarded. Even though in many hundreds of cases—as it will be—our care results in nothing but a transitory diagnosis that passes through our minds, yet some time, to some woman, it may mean her life.

Tuboovarian Varicocele.—[Since Richet and Devalz first drew attention to tuboovarian varicocele and its supposed frequent association with retrouterine hematocoele, little attention has been paid by gynecologists to this affection.] Michel and Bichat¹ distinguish two main varieties: (1) A varicocele of the broad ligament accompanying a pelvic tumor or a prolapse, and being of secondary importance compared to the main affection; (2) a tuboovarian varicocele, constituting the principal and essential lesion, being always secondary to an antecedent pelvic inflammation. They quote a case of the latter class in a patient, aged 24, who had suffered from pelvic pain, irregular menstruation, and leukorrhea for 5 years. These symptoms commenced 2 months after an apparently normal puerperium, and followed a heavy fall. Vaginal examination showed a soft enlargement of the cervix with an old left-

¹ Arch. gén. de Méd., June 9, 1903.

sided laceration, and bimanually a boggy thickening of the upper part of the left broad ligament, tender on pressure, was felt. The diagnosis of chronic cervicitis with salpingitis was made. Laparotomy was performed, when an enormous varicocele was found extending from the uterus to the parietal peritoneum on the left side. The ovary was small, atrophied, hard, and cystic; the tube was slightly thickened. Microscopic examination of the ovary showed an enormous dilation of the lymphatic vessels at the hilum, and considerable fibrous thickening of the external coat of the veins. Various causes for tuboovarian varicocele have been given—want of support of the veins, congenital weakness in their walls, absence of valves (Dudley). Of mechanic causes, constipation, repeated pregnancies (Budin), pelvic tumors, uterine displacements; affections of the heart, lungs, and liver, by inducing a venous stasis, may cause an alteration in the vascular walls. The authors suggest a totally different etiology for the case quoted—namely, an attenuated infection, during the puerperium, of the lymphatics of the tuboovarian pedicle, with extension to the neighboring vessels, producing a periphlebitis with subsequent dilation. In support of this theory they adduce the argument that there was a cervical laceration on the same side as the varicocele, with great dilation of the lymphatic vessels in the broad ligament. Further, the ovary on that side was sclerosed and cystic, which they consider evidence of an attenuated infection. De Sinety has observed similar conditions in one other case, and the authors urge the careful examination of the lymphatic vessels in future cases and tuboovarian varicocele associated with a sclerosed and cystic ovary.

Objections to the Vaginal Route in the Treatment of Ectopic Gestation.—[The treatment of this condition has gone through an evolution from a stage of inaction to one of prompt surgical action, passing an intermediate one of electric application.] At the present time J. W. Bovee¹ believes that no physician would fail to recommend surgical treatment once the diagnosis is made. Failure of diagnosis is due to faulty early teaching. Symptoms of slight rupture of a pregnant tube may occur, particularly in the early stages, at a time when menstruation is expected, or even earlier. The same is true of tubal abortion. In both conditions there may be no evidence of shock, but when it does occur, it is typical. Pain and collapse are usually less than are said to be present. Any inflammatory condition of the pelvic peritoneum, tubes, or ovaries may give as much pain, and because of its slight degree, these cases are often mistaken for uterine abortion. Severe internal hemorrhage is not so liable in early rupture as abortion of a pregnant tube in the early stages, as it is then more apt to be slow and may be but slight. The expulsion of a decidua at this time may be overlooked. Bovee's reasons for preferring the abdominal route in operating on these cases are: (1) The field of hemorrhage can be more quickly reached, taking into consideration the relative amount of time consumed in cleaning the two routes under anesthesia. (2) The condition can be more readily treated and the ligation of blood-vessels more readily and cer-

¹ Am. Jour. Obstet., June, 1903.

tainly performed. (3) The danger from secondary hemorrhage in ectopic pregnancy is markedly less when the bloodvessels are ligated than when the removal of the clots alone is practised. (4) Any other important pathologic lesion requiring attention may, in suitable cases, be attended to in the same sitting. The shock, as a rule, will be less than when the vaginal and abdominal incisions are both made. (6) The tube can be more readily removed than by the vaginal route. (7) The abdominal route is applicable to all stages of pregnancy, which is not true for the vaginal route in the latter months. (8) The vaginal incision has no place in the treatment of an unruptured pregnancy, while the abdominal incision is the route *par excellence*.

LABOR AND THE PUERPERIUM.

On Uterine Action.—[In an able and valuable work by a leading obstetrician of to-day it is stated that "the principle not to deliver in the absence of uterine contractions is the first point in the prevention of postpartum hemorrhage. Do not pull away the placenta without waiting for uterine contraction." In traction with forceps he says, "pull with the pains, leaving off pulling between the pains."] To this principle so laid down Wm. Stephenson¹ takes exception, for the following reasons: (1) There are no clinical data in its support; (2) it is not in accordance with his own experience and that of others who, when necessity has arisen, have not hesitated to empty the uterus deliberately without waiting for pains, and without thereby inducing hemorrhage; and (3) the opinion is a logical deduction drawn from an erroneous idea of the uterine action. First, let us consider the behavior of the uterus during the operation of cesarean section. The operator does not wait for a pain, but as soon as the membranes are ruptured he must deftly remove the child, otherwise he would find himself hampered by the rapid closing of the walls—not from contraction, but retraction; the wall at once resiles when freed from the cause of expansion. Again, he does not wait for contraction before extracting the placenta, but peels it off, trusting to retraction to restrain the bleeding. Secondly, for various complications of pregnancy it has at times been deemed advisable to empty the uterus artificially without at first inducing labor. The cervix is dilated, and the child removed without waiting for or even desiring uterine contractions. Does the uterine cavity remain undiminished though empty, and does hemorrhage occur more frequently than under other circumstances? Thirdly, take a case of excessive hydramnios, in which the patient is suffering much pain, and in which, from difficulty of breathing, she cannot lie down. To afford relief one does not wait for labor to set in, but ruptures the membranes without hesitation, and the uterus will steadily retract. Fourthly, in severe hemorrhage in the third stage with retained placenta, or postpartum where the uterus has melted away from the grasp and the fundus cannot be defined by the left hand externally, Stephenson has invariably introduced the right

¹ Brit. Jour. Obstet., May, 1903.

hand to remove the retained placenta. Here one can observe the difference between the sudden closing in the cavity by contraction and the more gradual, often slow, but progressive, action of retraction. The latter is by far the most frequent result. With such evidence as the above study of the subject can there be any doubt that, apart from contraction, the uterus possesses the power of reducing its volume and capacity when emptied of a part or the whole of its contents? Although Duncan said at the time that he wrote "that retraction is not dependent is difficult to prove," now that we possess clearer views on this subject his other statement must be accepted as true that, "retraction is a separate and distinct function—that is, it may go on without contraction."

The Beginning of Labor.—In attempting to explain the causes which bring the series of physiologic acts that result in the expulsion of the fetus at the end of pregnancy, L. Blumenreich¹ was led to make a number of exhaustive animal experiments. He sought especially to determine whether the gravid uterus responds more readily to stimuli than the organ when nonpregnant. In order to rule out spontaneous contractions of the uterus, the experimental animals were placed in a bath of warm saline solution. It was found that in the presence of an excess of carbonic acid or an insufficient supply of oxygen the uterus of the gravid rabbits reacted much less strongly than that of the nonpregnant animals. The observations of Runge were confirmed, namely, that lack of oxygen affords a more powerful stimulus to uterine contraction than an excess of carbonic acid. In not a single instance was it possible to bring on labor by respiration in CO₂. Mechanic irritation affords a much more marked stimulation to the gravid uterus, and, moreover, meets with a more ready response than in the nonpregnant organ. By means of mechanic irritation alone it was often possible to induce premature labor. These experiments seem to prove quite conclusively that mechanic influences play a much more important rôle in the induction of the labor act than changes in the gaseous contents of the blood. If this be assumed, the probabilities are strengthened by the fact that these mechanic sources of irritation are increased from day to day by the increase in the volume of the gravid uterus.

Loss of Blood During Labor.—[More or less uncertainty exists as to what shall be considered a normal amount of blood lost during a labor.] From statistics relating to over 6000 labors F. Ahlfeld² has deduced certain facts which he believes to be of practical value. It was only by the aid of a specially arranged bed that he was able to estimate accurately the exact quantity of blood lost in each case. In the middle of the mattress is an opening, accommodating a funnel which catches the blood and conducts it to a graduate placed under the bed.

The blood which comes away before the birth of the placenta, that which passes with the placenta, and, lastly, that which is voided after the labor proper, is separately measured. Care is taken that the annectic fluid and urine are carefully excluded. If at any time the amount of blood in the graduate exceeds 400 cc., the attending physician is at once

¹ Arch. f. Gyn., 1904, Bd. lxxi, No. 1.

² Zeit. f. Geb. u. Gyn., 1904, Bd. li, No. 2.

called. In Ahlfeld's experience the placenta is wont to remain in the vagina in the majority of cases, if the patient is not disturbed, from one and one-half to two hours, and this he believes is the normal course. In 13 % of cases in which the placenta was delivered spontaneously, a greater amount of blood (673 cc. on an average) was lost than when the birth of the placenta was delayed. In estimating the influence of previous births on the amount of hemorrhage it was found that the increased amount was due rather to the increasing size of the children and their placentas than to the number of previous labors. The length of the expulsive period did not seem to have any marked effect on the amount of blood lost. The most bleeding takes place during the first hour after the child is born. In pathologic cases the same procedure was attempted—i. e., to wait, whenever possible, with the expression of the placenta, for about 2 hours. In over 21 % of the cases this period of waiting could not be adhered to, but the large number remaining shows that only for definite reasons, such as hemorrhage, should the third stage of labor be hastened. The after-effects of this loss of blood on the patient's condition are somewhat a relative matter. In normal, strong individuals a loss of even 1000 cc. may not be followed by any evil consequences. For weak or sick persons no rule can be formulated. Where 1500 to 2000 cc. are lost, it was found that in the majority of cases only slight or moderate degrees of anemia resulted. When the amount lost exceeds these figures, the result depends more or less on the patient's condition, and whether the loss is sudden or gradual, 4 cases being reported where the woman lived even after having lost 3000 cc. In considering the after-effects of hemorrhage Ahlfeld believes that his statistics show that the danger of puerperal infection is increased in proportion to the amount of blood lost. The mother's ability to nurse does not appear to be very much affected, as about 50 % of the breast-fed children reached their birth-weight by the tenth day. It seems, from these observations, that healthy women can experience a considerable degree of hemorrhage during labor without being seriously influenced.

Cervical Coiling of the Cord.—[In almost every text-book of midwifery, whether written for the use of students or of midwives, the attendant is recommended, in a case of normal labor after the birth of the head, to feel whether or not the cord is placed around the child's neck. If it is found in this abnormal position, then he is told to slip it over the child's head or over the shoulders, or if these two maneuvers are found impracticable, to divide it between two ligatures.] Schultze¹ throws grave doubts upon the correctness of this teaching. As he points out, the dangers of such a position of the cord are threefold: There is, first, the danger of the pressure of the cord upon the vessels of the neck, producing stoppage of the circulation through the child's brain; secondly, the danger of the pressure to which the cord is in its turn subjected by the neck arresting the circulation through the former; and, lastly, the danger of the cord being compressed between the neck of the child and the anterior wall of the pelvis toward the end of the second stage of

¹ *Zent. f. Gynäk.*, Sept. 19, 1903.

labor. Naegele was the first writer to call special attention to the last of these dangers. Veit has recorded 2250 cases of vertex presentation, in 442 of which the cord was around the child's neck. Among these latter the fetal mortality was 1 in 61, and the number of children born asphyxiated was 1 in 7. In the cases in which the cord was not around the neck the corresponding numbers were 1 in 92 and 1 in 25. If, however, we consider the figures for primiparas and multiparas separately, we find that among the former, when the cord was around the neck, the number of children born asphyxiated was three and a half times as great as when it was not, and the mortality was almost twice as great, while among the latter there were no deaths, although the number of cases of asphyxia that occurred was four times as great as in cases of normal labor. Since the conditions as regards the pressure of the cord on the vessels of the neck and the pressure of the neck in its turn on the vessels of the cord would be the same in the two series of cases, these figures tend to show that the main danger of this abnormality is almost entirely due to the compression of the cord between the neck of the child and the anterior pelvic wall. It is obvious that the chances of such compression occurring to a dangerous degree are considerably greater in the case of the prolonged second stage in primiparas than in the relatively short second stage that occurs in the majority of multiparas. Schultze points out that as soon as the child's head is born, any such danger disappears, since it is no longer possible for the cord to be compressed in this manner. In any cases, however, in which, after the birth of the head, there are present signs of impending asphyxia of the child or of danger to his life, we must proceed at once to hasten the delivery of the shoulders, quite irrespective of the position of the cord. In these circumstances, therefore, the fact that the cord is around the neck is not the ground upon which we interfere. [The coiling of the cord around the neck of the child at the time the head is born does not of necessity furnish any indication for interference, and the routine practice of introducing the fingers into the orifice of the vagina at this stage of labor is not without danger. Abrasions and tears of the mucous membrane are present in many instances, and the danger of septic infection is the greater in that the hand most commonly employed for this purpose will be the right one, which has been guarding the perineum and is very likely, therefore, to be soiled with fecal matter. For these reasons we may well question with Schultze whether the current teaching as to the dangers of this complication and the necessity for its immediate correction does not stand in need of revision.]

Perineorrhaphy and Trachelorrhaphy.—B. C. Hirst¹ makes an urgent plea for the prompt repair of all lacerations of the parturient canal after labor. He says that it is singular that immediate repair is largely restricted to laceration of the posterior wall and pelvic floor. The frequency with which cervical lacerations are followed by carcinoma and the discomfort of a cystocele is such that it is probable that injuries of the pelvic floor are of subordinate importance in traumatism of the

¹ Proc. Phila. Co. Med. Soc., Feb. 29, 1904, vol. xxv, No. 2, p. 55.

genital canal. He has been impressed for some time with the advisability of repairing all lacerations of the genital tract, but the principle has not been unreservedly adopted until within the last two years, since which time not a pathologic consequence of labor has been allowed to remain uncorrected in the University Maternity. In 53 cases during the past year the cervix has been repaired in puerperal patients. All the operations were performed after the fifth day, and usually at the end of the first week. The routine examination of the anterior vaginal wall frequently shows a rupture of the fascia and muscles of the urogenital trigonum. This is the first step in the pathologic process that ends in a cystocele. The laceration is usually submucous, but it is quite as easily repaired as the analogous injury in the posterior sulcus. The anterior vaginal wall has been repaired in 42 patients during the past year, and in each instance with a perfect restoration of its muscular and ligamentous support. Hirst believes that the same rules should be applied in private practice that are used in the large maternities.

R. L. Dickinson¹ remarks that just after delivery, when a cervix is swollen and distorted, it is impossible accurately to coapt the torn parts. Months or years after delivery, when the torn cervix is altered by contraction and chronic inflammation, accurate coaptation is again impossible. There is a time when neither deformity from trauma nor distortion from defective healing is present. This is the desirable time to repair the cervix. A second valid objection to an immediate repair is that bleeding obscures the work. In addition to those objections the fact remains that immediately after labor an anesthetic should not be administered, and ordinarily the conditions are not favorable to accurate work. Sutures cannot be placed in badly contused and swollen tissues so as to hold satisfactorily. Immediate suture should be limited to those cases in which there is hemorrhage from a cervical tear which is not controlled by the hot douche or ergot. The favorable time for the repair of the cervical laceration is from the third or fourth to the fourteenth day after delivery. The operation is advocated only for extensive laceration of the cervix running up into the body of the uterus or out into the vaginal wall.

MATERNAL DYSTOCIA.

Puerperal Eclampsia—A Statistical Study.—Buttner² contributes the results of an extensive statistical study in eclampsia. The number of confinements available for study was 143,304. Among these occurred 321 cases of eclampsia, or 1 in 446.4. The frequency of eclampsia was considerably increased since the former statistics, taken from 1885 to 1891. Among these patients, 73.7 % were primiparas, and 26.3 % multiparas; 18 % of the primiparas were older than 28 years and 5 % were 17 years and younger. Twin pregnancy was present in cases of eclampsia in 6 %. Although the frequency of eclampsia was increased in those portions of Germany from which these statistics were taken,

¹ N. Y. Med. Jour., Mar. 26, 1904.

² Arch. f. Gyn., 1903, Bd. lxx, Heft 2.

the mortality was somewhat diminished. In the series of cases reported the mortality was 21.12 %, in contrast with a previous mortality of 34.8 %. The results of treatment are shown in the fact that in districts where physicians could be obtained with difficulty the mortality rose to 27.4 %. In 3 cases diagnosis was not made during life, and the patients perished undelivered. The mortality of eclampsia occurring during labor was 20.5 %. When eclampsia developed after labor, the mortality was 24.07 %. The longer after delivery the eclampsia occurred, the better the prognosis for the mother. If, however, eclampsia develops during the latter portion of the first day after labor, the mortality rises considerably. The mortality for the fetus was 29.7 %. Here again, among cases in the country and in small hamlets, the mortality among children was greatly increased, rising to 32.4 %. About 50 % of the mothers required artificial delivery. It is shown that prompt interference during labor, resulting in the rapid delivery of the child, improves the mother's chances in those cases in which eclampsia develops during parturition. When the mother dies of eclampsia during labor, the fetal mortality is enormously increased. In cases in which the mother dies after the delivery of the child the chances of the fetus for survival seemed to be fairly good. Regarding the repetition of eclampsia in the same patient, it was found that 2.4 % of the patients had eclampsia more than once. The effort was made to determine the influence of the weather upon the occurrence of eclampsia, and it was found that the colder months showed an increase in the percentage of cases. The percentage of moisture in the atmosphere seemed to influence the occurrence of eclampsia, as the drier the air, the better the conditions for the patient. Extremes of heat and cold were both marked by an increase in eclampsia. Regarding the question as to the relationship existing between eclampsia and labor-pains or contractions of the uterus, it was determined that eclampsia is not caused by labor-pains, but that eclampsia first occurs and then uterine contractions. Both contractions of the uterus and eclamptic convulsions result from the irritation by the same poison. As regards the occurrence of eclampsia in epileptic women, upon close examination of the history of cases but 2 could be found in which it seemed probable that epilepsy and eclampsia occurred in the same person.

Modern Theories of Eclampsia.—[The old theories of a renal origin of eclampsia hardly fit into the present knowledge of this disorder, and many views have been advanced which make an intoxication with fetal elements possible. The earliest attempt to explain eclampsia in this direction took for granted a direct poisoning of the system with placental tissue, which readily finds its way into the maternal circulation. Experiments do not, however, bear out this theory, for the injection of placenta into pregnant animals of the same or different species is never followed by symptoms in any way suggestive of eclampsia. According to another theory, every animal destroys its own placental emboli by means of a specific antibody, which is produced only too readily in excess and then acts as a poison. Subdural injections of this syncretolysin

have indeed set up eclamptic convulsions, but subcutaneous and intravenous administration is harmless.] The following theory seems more plausible to E. Wormser.¹ Poisonous proteid bodies are produced, while placental tissue is dissolved, in the maternal blood; these syncytiotoxins are neutralized under normal conditions, but lead to eclampsia if insufficient antitoxin is produced. If specific serum is allowed to act upon the placenta and the resulting emulsion injected into animals, it is very often possible to induce the typical symptom, and, what is more important, the typical lesions, of eclampsia. Wormser has repeated all the experiments which have led to the above theories, and can record only negative results. Even the precipitin reaction which is supposed to manifest itself by precipitation when specific serum is mixed with placental tissue in a test-tube could not be obtained. The portions of syncytium which had been treated for several hours had not lost their macroscopic or microscopic appearance, so that a specific action is at best doubtful.

Barton Cooke Hirst² gives the results of his experience of more than **100 cases of eclampsia**. He says there are 3 points on which clinical experience throws light: etiology, the premonitory signs, and treatment, preventive and curative. In regard to etiology, he says it has been his experience that pregnant women with nephritis, or with a hereditary predisposition thereto, almost invariably require active treatment to combat a gestational toxemia, and usually a premature termination of pregnancy is necessary. There is nothing, therefore, in clinical experience to shake belief in insufficient renal activity as a cause of eclampsia, and we should hold fast to the lesson, taught by many a bitter experience, that nephritis in pregnancy is one of the gravest complications, demanding constant care and never to be regarded with indifference. Among the premonitory signs of eclampsia there is nothing comparable in value, to the experienced physician, with albumin in considerable and increasing quantities in the filtered urine. It is true that a certain proportion of cases occur without precedent albuminuria, but their proportion is not nearly so large as one would infer from the report of sporadic cases, with which recent medical literature is filled. In all his cases there were only 2 in which albumin was absent. In one of these the necropsy showed a chronic nephritis dating from an attack of scarlet fever 5 years before. In a recent report of 322 cases of eclampsia from the Charité in Berlin albumin was absent in only 6. There is no other symptom of a gestational toxemia and threatened eclampsia so constant and characteristic as this. The urea-excretion is valueless in comparison. Pregnant women excrete anything from 3 to over 30 grams a day, but usually less than the normal 20 to 24 grams. He has repeatedly seen a very low output without the slightest disturbance of health, and occasionally a rapidly increasing toxemia with an excretion of more than 30 grams. Any one who is ill-advised or inexperienced enough to attach much importance to urea-elimination as a sign of gestational toxemia or threatened eclampsia will be constantly making blunders in diagnosis

¹ Munch. med. Woch., Jan. 5, 1904.

² Proc. Phila. Co. Med. Soc., Dec. 31, 1903.

and treatment. Casts other than hyaline should, of course, be looked for, but their quantity cannot be measured. It is a clinical rule, with few exceptions, that albuminuria precedes the other signs of gestational toxemia; that the gravity of the woman's condition can be measured by the steady increase in the amount of albumin in spite of treatment, and it is the most constant premonitory sign of eclampsia than we possess at present. The preventive treatment consists, as every one knows, of mild diet, diaphoresis, diuresis, and catharsis, with extra precautions against chilling the skin. The use of thyroid extract, as proposed by Nicholson, is still on trial. Increasing experience has forced Hirst to the conclusion that the rapid evacuation of the uterus is not the proper treatment. He is better satisfied with the treatment directed solely to the eclampsia without regard to the uterine contents, until such a degree of dilation of the os is secured spontaneously that delivery can easily be secured without violence. In antepartum eclampsia evacuation of the uterus is indicated only if, after the eclampsia is controlled, the patient's urine is persistently albuminous and filled with casts, or if other symptoms of gestational toxemia continue to a degree that excites anxiety. In such a case it is better, if possible, to induce labor slowly by bougies or the Voorhees bags rather than to resort to a forced delivery. Meanwhile the eliminative treatment by diuresis, catharsis, and diaphoresis should be actively employed. It necessarily follows that any one holding these views cannot approve of cesarean section for eclampsia. There is no treatment of the disease with so high a mortality except the pilocarpin treatment. One has a mortality of over 40 %, the other of over 60 %. As to the treatment of the convulsions, it is well understood that we must employ two sets of remedies: one to eliminate the poison, the other to quiet nervous irritability and muscular activity. It is generally agreed that normal salt-injections, sweats, and purgation are the most reliable measures under the first heading. Diuretics during eclampsia are of no use, because the kidneys during the attack are practically nonexistent as excretory organs. There is usually anuria or a scanty quantity of bloody and albuminous urine, in which, by the way, the percentage of urea is often normal for a pregnant woman. Venesection should be classed among the eliminative measures; but after resorting to it almost routinely at first, he now rarely does so. Among the sedatives, chloral and opium dispute the field. Hirst confesses to a prejudice against the latter, because it antagonizes the eliminative treatment, and there is, it would seem, danger of fatal poisoning from the large doses required, in view of the inactivity of the kidneys. For the relief of the arterial tension and spasmodic contraction of the arterioles he has always used veratrum viride. An experience of 20 years with it confirms the good impression originally conceived. Finally, he urges the advantages of treating eclampsia in a well-appointed hospital. Nothing is more disheartening than the inadequacy of this treatment observed in consulting practice in private houses. If cases of eclampsia were transported in an ambulance without delay to a hospital well appointed for their treatment and with a staff thoroughly drilled in the

management of such cases, the mortality could be kept at or under 13 %, which is less than half what it is in private practice. In other words, a patient would have more than double the chance of recovery that she has in her own home.

The Blood and Urine in Eclampsia.—For the purpose of deciding whether eclampsia is a consequence of insufficient renal activity and can therefore be ascribed to a uremic intoxication, an investigation was carried on by W. Zangemeister.¹ An explanation of this condition should be secured from examinations of both blood and urine. Before any opinion can be expressed on abnormal conditions it is necessary to be acquainted with the normal relations of blood and urine as found in healthy pregnant women. Zangemeister has already shown that the physiologic makeup of blood and urine in pregnancy varies considerably from the nonpregnant state. From an examination of a large number of specimens of the blood taken from eclamptic cases he does not find that there are any points upon which the uremic etiology of the diseases can be based. There is a diminution in the alkalinity of the blood, and at times an increased molecular concentration, together with a larger amount of crystalloidal nitrogenous bodies, but these must be considered as an accompaniment of the diminished diuresis which is usually present during the course of the disease. The factors just enumerated are subject to greater variations in the blood of eclampsia patients than otherwise. The most noteworthy appearance in eclamptic blood is the extreme variation in the quantity of red cells to the quantity of the blood-plasma. The blood contains, on an average, a larger number of red cells, and in fact may be compared to a "paste of corpuscles." The rapid disappearance, and, even more so, the rapid formation, of this condition, shows that the cause of this phenomenon is not to be found in an overproduction of these elements. The proliferation itself does not represent the cause of the eclampsia, as it is absent in many instances; nor does it result from the attacks, as it may appear without any seizures having been present. The only way in which the phenomenon can be explained is that during the course of the disease severe circulatory disturbances occur, as a result of which a considerable amount of plasma leaves the blood. Concerning the urine of normal pregnancy, Zangemeister has shown that during the last month there is an increase in the amount passed during 24 hours, the ammonia salts are slightly increased, and the chlorids are about the same as in the nonpregnant woman. The phosphates are, as is well known, decreased in amount—this being ascribed to the fetal bone-formation. During labor it was found that less water and salts were excreted by the kidneys than during the period immediately preceding. Especially is the excretion of chlorids diminished; that of the phosphates and ammonia salts is less marked. A very complete series of analyses was then made of the urine of numerous cases of eclampsia. These do not admit of being abstracted, and the results obtained do not lend themselves to an explanation of the manner in which the irritation of the vasomotor centers

¹ Arch. f. Gyn., 1904, Bd. lxx, No. 3.

is produced. Whether this is due to toxic conditions or to a reflex nervous disturbance is, therefore, still a matter of doubt so far as Zangemeister's findings are concerned. If one has to do with a toxemia, it may be stated with considerable certainty that the poison does not result from insufficiency of the renal function nor does it leave the body through the kidneys, unless in an entirely changed form a considerable time after the disease has subsided. In other words, for the elimination, or more properly the destruction, of this hypothetic toxin, the renal function is not called into play. The poison, moreover, does not bring about any increase in the molecular concentration of the blood. The changes found in the body in an eclampsia case may also be accounted for without the intermedium of a poison. Zangemeister brings forward the following facts as against the idea that a toxin is present: The earlier the course of the pregnancy or the later in the puerperium the attack comes on, the more severe it is apt to be, and it is more apt to occur with the first labor-pains than after these have been present for some time and have produced a toxin or thrown the same into circulation. Although there may be some basis in fact for assuming the toxic theory, he is inclined to the belief that this is questionable and that later investigations will show that the eclamptic attack is brought about in some other way—possibly as a purely reflex nervous phenomenon.

Treatment of Puerperal Eclampsia.—Before the Edinburgh Obstetrical Society H. O. Nicholson¹ recommended thyroid extract as a prophylactic in eclampsia. It is claimed that the thyroid extract acts by increasing oxidation and improving the metabolism of nitrogenous products. The dose of the thyroid extract is from 5 to 20 grains daily. After the convulsions have begun the thyroid extract will be found useful, but it must be given in larger doses than when it is employed as a prophylactic. The urine in eclampsia is frequently diminished, and in such cases the thyroid will be found to act as a diuretic. The purpose of the treatment is to restore the secretion of the kidneys. In eclampsia there are marked constriction of the bloodvessels and a high blood-pressure. This the thyroid extract overcomes to the point of intoxication. When the full effects of the drug are experienced, the renal arteries relax and the secretion of the urine commences. A combination of morphin and thyroid extract is one of the best prescriptions for reëstablishing the function of the kidneys.

W. E. Fothergill² reported a case of **hypertrophy of the fetal thyroid** with maternal eclampsia. The case was of interest in that it was one of 5 recorded instances of hypertrophy of the thyroid gland in the child when potassium chlorate had been administered to the mother during pregnancy; also in the fact that thyroid extract was used for the eclamptic condition of the mother. No definite conclusion is drawn from the fact that potassium chlorate was administered in these cases other than that such administration during pregnancy may be followed, under circumstances not at present fully understood, by hypertrophy of the thyroid gland of the fetus. Yet many healthy

¹ Medicine, Feb., 1904. ² Jour. Obstet. and Gyn. of Brit. Emp., Jan., 1904.

children are borne by mothers who have taken this drug. In this case the weight of the gland was 25.8 gm., the normal weight being 1 to 2 gm. No colloid material was present in the glandular spaces, so the specialization of the gland might be said to have been retarded. The enlargement appeared to be due to an overgrowth of all the tissue elements, especially the glandular, and there was no indication of inflammatory action. The mother showed evidences of renal inadequacy in the thirty-fifth week of her fifth pregnancy, the amount of urea falling to 270 grains daily. Vegetable diet and two 5-grain tablets of thyroid substance improved the excretion of urea. Later the patient had convulsions and was semicomatose. The os remained closed and there were no labor-pains. Morphin, hot-water bottles, calomel, and thyroid (45 grains in 24 hours) were given. The next day 35 grains of thyroid were administered. The patient was much better. Next day she was delivered. There was anuria for 24 hours after birth; 30 grains of thyroid were given. Next day 5 pints of urine were secreted, and 15 grains of thyroid given. The temperature remained normal; a pulse of 150 indicated some degree of thyroidism. An important point was the increase in urea after the administration of thyroid and before the eclamptic attack. Fothergill held that the occurrence of convulsions after labor shows that the contents of the uterus do not determine eclampsia; that it is not reasonable to suppose that metabolic change which has been going on for months will be affected by the immediate termination of pregnancy; that the added shock of accouchement forcé may have caused many deaths in eclampsia.

Operative Treatment of Eclampsia.—G. M. Edebohls¹ records a second successful case of puerperal eclampsia treated by renal decapsulation, while T. A. Helme² reports a case treated by spinal subarachnoid puncture. His belief is that if the convulsions are the result of an increased intracranial pressure, tapping of the spinal cord ought to give speedy relief. The result, in his experience, was most satisfactory.

Contracted Pelvis.—J. M. M. Kerr³ says that exact measurement of a pelvis is of less importance when the degree of contraction is either very slight or very great, as in the former case forceps are applied and in the latter case Cesarean section is performed, but in cases of medium deformity accurate measurement is essential. Among the more accurate pelvimeters, those of Skutsch and Faulk might be mentioned. Another point of equal importance is the size and consistence of the child's head, and there are many difficulties in arriving at this. It has been said that the fetal head is the best pelvimeter, and one mode of determining suitable treatment is to determine the relation of the head to the pelvis. This might be done by combining practically the methods of Müller and Pinard. With the right hand the accoucheur takes the Pawlic grip of the head and presses the head into the pelvis, while with two fingers of the left introduced into the vagina he feels how the head engages, and at the same time, with the thumb, he feels all along the brim and

¹ Boston M. and S. Jour., June 2, 1904.

² Brit. Med. Jour., May 14, 1904.

³ Lancet, Mar. 12, 1904.

estimates the degree of overlapping. By this method the chances of the head passing the brim, the degree of traction required, and the consistence of the head can be estimated. Objections which might be raised to the method are that an anesthetic is necessary and that the presentation may be a breech. As a matter of fact, an anesthetic is not always necessary and a breech-presentation may be converted before the thirty-sixth week by external version. When the disparity between the size of the head and the pelvis is slight, delivery might be attempted in the Walcher position. It is difficult to fix a degree of deformity below which spontaneous birth is impossible. Thus, in 2 cases a rachitic dwarf delivered herself without assistance, the child weighing $7\frac{1}{2}$ pounds on one occasion, the maternal conjugata vera being $3\frac{1}{2}$ inches. Forceps of the Simpson or Milne Murray type are the best; Walcher's position is an advantage; an anterior parietal presentation is the most favorable, and the lowest limit for forceps should be a conjugata vera of $3\frac{1}{2}$ inches, and then only if the head be not too large for the pelvis. Version is more dangerous to the mother, and the fetal mortality is much higher. Induction of premature labor would be the ideal treatment if the cases were seen at a sufficiently early stage; it is undesirable to induce premature labor before the thirty-fourth week.

Hahl¹ gives the result of 84 cases in the obstetric clinic of Helsingfors in which labor was induced for contracted pelvis. His statistics cover the practice of the clinic for 32 years, and the cases occurred among 23,000 patients. The relative frequency of the operation was 1 in 274 confinements, or 0.365 %. In Leopold's clinic the operation was done once in 131 patients, and in a subsequent series of cases once in 151 patients. Braun's statistics give 1 in 441 patients; Chrobak, 1 in 627; Pinard, 1 in 150, and Walter, 1 in 165. The smallest true conjugates in these cases were 7 cm. in 3 and 7.5 cm. in 1 case—a flattened and symmetrically contracted pelvis. The earliest period of gestation at which pregnancy was interrupted was 30 weeks in 1 case, and the latest, 38 weeks in 7 cases. The average was from the thirty-fifth to the thirty-sixth week. In 7 cases the fetus was in a transverse position. This was corrected by version or spontaneous evolution. The complications which occurred during the labors were transverse presentation in 5 cases, breech-presentation in 2, prolapse of the cord in 3, lateral placenta prævia in 1, and threatened rupture of the uterus in 1; 29.76 % of the cases terminated in spontaneous birth; 70.24 % required operation. Version was done most frequently and forceps were applied next in frequency. Craniotomy was performed but twice, or in 3.38 %. The results of this series of cases were as follows: The maternal mortality was 2.38 % from all causes. From septic infection alone the mortality was 1.19 %. The maternal morbidity was 7.23 %. Of the 84 children, 75 % were born living and 25 % were stillborn: 59.52 % were discharged living from the hospital, while 13 of the 63 children born living died in the hospital during the first 2 weeks. Of the children who left the hospital living, 84 % survived for a year, which was one-half the entire number of children born alive.

¹ Arch. f. Gyn., 1903, Bd. lxx, Heft 3.

PLATE 7.



De Lee's case of double dislocation (congenital) of the hips complicating pregnancy
(Clin. Rev., September, 1903).

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J. B. De Lee¹ reports a case of labor occurring in a primipara 28 years of age presenting a double congenital dislocation of the femurs. Delivery was accomplished by means of axis-traction forceps. The accompanying illustrations on Plate 7 present the typical features.

Rupture of the Uterus.—Labusquière² has prepared an important monograph on this subject, based upon the experience of different authorities since antiseptic midwifery was established. Altogether, surgical treatment offers the patient the best chance of recovery, while expectant measures involve the most peril. This treatment includes several methods, from panhysterectomy to "exclusive suture." By the latter term is understood Zweifel's method of applying sutures to the serous coat alone, so as to convert a total into an incomplete rupture. The uterus is exposed by an abdominal incision; the pelvis must not be elevated, lest blood and lochia should run up into the upper portion of the peritoneal cavity; lastly, all blood is removed "to the very last drop"; then the sutures are applied to the serous coat on each side of the laceration and tied. This "exclusive suture" method was first tried on a patient so collapsed that panhysterectomy was out of the question. The thorough drying of the peritoneal cavity is essential in this operation. Labusquière admits that any form of major surgery must be out of the question in many cases of rupture during labor, owing to surrounding circumstances; then conservative or obstetric measures alone can be employed. He notes the great success of packing and draining the uterus in Pajot's wards, nearly 20 years ago, and then compares, as others have done, Varnier's statistics, in which the mortality after simple packing and draining was very high, operations being far more successful. Abdominal section, followed by complete suture of the laceration so as to unite the muscular coats and spare the patient the perils of a weak cicatrix in the uterine walls, has been followed by successful results. It is, however, bad surgery, as a rule, since the edges of the wound are probably septic before suture, and so complete suture should not be attempted save where the rupture is small and noninfection practically certain. Zweifel's "exclusive suture," therefore, seems the best conservative surgical method. Klein still supports packing and drainage, and Franke, of Wurzburg, in a recent work on the subject, advises the practitioner, when rupture of the uterus occurs in private practice, to deliver through the vagina if possible, to apply a pad and bandage to the abdomen, and to insert a drainage-tube or a strand of iodoform-gauze into the uterus.

Dorland³ records a case of rupture of the uterus successfully treated by operation, and compares the results of this method of treatment with those obtained by the expectant plan. He states that during the past 3 years (1901-03) there have been recorded in the world's literature 50 cases of uterine rupture. Twelve of these cases resulted fatally, giving a mortality of 24 %. Three of the patients died of hemorrhage or shock before any course of treatment could be instituted. Sixteen

¹ Clin. Rev., Sept., 1903.

² Ann. de Gyn. et d'Obstet., July, 1903.

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³ Medicine, June, 1904.

of the women were treated expectantly,—that is, with uterine and vaginal tamponade and drainage,—and of these, 4 perished—showing a mortality of 25 %, which was greater than the total mortality for the 50 cases. Thirty-one of the patients were treated by operation, the method adopted being either suturation of the uterine wall, the Porro operation, or total extirpation of the uterus, and of these cases 5 were fatal. This yielded a mortality of $16\frac{4}{5}$ %. The great superiority of the operative course of treatment according to the modern technic is evident from this showing. Of the 16 cases treated expectantly, 7, or 43 $\frac{1}{2}$ %, showed an incomplete tear of the uterine wall, while of the operative cases only one showed a rupture of this nature. All these 8 cases recovered. Of the 9 cases of complete laceration of the uterine wall treated by tamponade and drainage, 4, or 44.4 %, perished. If we compare this with the 30 cases of complete rupture with 5 deaths,—a mortality of $16\frac{2}{3}$ %,—the inference must be obvious. The conclusions to be drawn from this brief study are as follows: Incomplete lacerations of the uterine wall, if the hemorrhage is moderate and the diagnosis accurate, may be well treated by careful vaginal and intra-uterine tamponade and an expectant course of treatment. Complete lacerations—the peritoneal cavity being opened—should, under unfavorable circumstances, such as uncleanness of locality and lack of surgical appliances, be temporarily treated by intrauterine tamponade and the administration of astringents and stimulants; the patient should then, if possible, be conveyed to a hospital and the abdominal cavity opened. Under favorable circumstances the cavity should be opened as speedily as possible and the rupture in the uterine wall sutured in suitable cases, or a Porro operation or a total extirpation be performed, according to the nature of the case.

Puerperal Hematoma.—Dorland¹ records a case of hematoma of the vulva in which the patient eventually died of cerebral embolism. (See Plate 9.) He gives the following classification of this rare complication of labor: The term puerperal hematoma is preferable as being generic, including the various subvarieties, which are named according to the site of development. Thus, the blood-tumor may form in the pampiniform plexus of the broad ligament. Such a condition is known to the profession as hematoma of the broad ligament, and may occur postoperative as well as during or after the process of labor. The tumor may be localized entirely in one or the other labium majus. This is the true vulvar or labial hematoma. It may, though rarely, be seen only within the vaginal tissues, and is then designated as a vaginal hematoma. Finally, it may appear mainly in the perineum at the site of one or the other ischiorectal fossa. This is more common and constitutes the well-known perineal hematoma. It is not unusual for these types to be more or less fused, as in the case reported by Dorland, the condition existing in which is admirably presented in the illustration (Plate 8). The hematoma in Dorland's case was a combination of the vaginal, labial, and perineal types—a vaginovulvoperineal hematoma.

Puerperal hematoma is of very rare occurrence, and it would require

¹ Am. Jour. Obstet., June, 1904.

PLATE 8.



Dorland's case of puerperal hematoma (Am. Jour. Obstet., June, 1904).

1. The first part of the document is a list of the names of the persons who have been appointed to the various offices of the city of New York.

the aggregation of several hundreds of cases of labor to arrive at the exact truth of its frequency, according to H. R. Coston.¹ The predisposing cause is the engorged condition of the pudendal vessels and the strain put upon them by labor; and to this may be added any pathologic condition of the vessels, such as sclerosis and varicosities. The exciting cause in most cases is the pressure of the fetal mass on the soft parts of the mother. The use of forceps or other instruments; symphysiotomy, or spontaneous separation at the symphysis pubis; the rapid delivery of the after-coming head; and the accidental striking of the parts against a hard substance are other causes. The vast majority of cases occur during labor, though it may take place after labor is terminated. When it is caused by injuries during labor, such as sneezing, violent coughing, or the act of quickly sitting up in bed, the exertion has caused to dislodge a thrombosis, and thus bleeding takes place. It may occur in any position, though usually it is in either of the labia majora. If the effusion occurs above the pelvic fascia, it forces itself upward; if below the pelvic fascia, it dissects toward the vulva. Pain may be more severe in a small hematoma that is stretching the skin than in a large hematoma which is subperitoneal. If the amount of blood lost is great, there will be present, besides the signs of hemorrhage, pain proportionate to the amount of hemorrhage and to the location of the blood. To the eye the tumor is blue or bluish-black in color, depending upon whether it is under the skin or the mucosa. Should a hematoma rupture while the hemorrhage is in progress,—especially if it should rupture intraperitoneally,—all the symptoms of hemorrhage would rapidly increase, and unless the attendant quickly made use of radical measures, the patient would soon bleed to death. Should the hematoma become infected, there would be symptoms of suppuration added, with the production of metastatic abscesses. The condition of hematoma must be diagnosed from varicose veins in the vulva, hernia, inversion of the uterus or vagina, blood-clot, the placenta, or a fecal mass in the rectum. Formerly hematoma was regarded as a very serious trouble, the death-rate being from 20 % to 40 %. In this day of asepsis it should not reach 7 %. In all cases the bowels must be kept open; the diet must be light, but nutritious; the woman must have stimulants, tonics, and alteratives as the case demands, always remembering to keep the stomach in a healthy condition. The skin and kidneys must be watched for septic processes. In failure of nutrition, in long-continued cases, some preparation of malt or beer is to be recommended. Those cases occurring before delivery will receive the same treatment as those occurring afterward, except that it may be necessary to incise the tumor to remove the obstructing mass.

Chronic Inversion of the Uterus.—(Reposition of the chronically inverted uterus is rendered difficult by the contraction of the parts in the neighborhood of the cervix. Many methods of manipulation and forms of instrument have been devised for bringing about reposition, but in a majority of the more chronic cases the attempts have been

¹ Am. Jour. Obstet., Apr., 1903.

unsuccessful, and injuries to the soft parts—occasionally fatal injuries—have been recorded.] Under these circumstances Reuben Peterson¹ recommends that operative treatment should be the rule. Operations for chronic inversion may be divided into two classes: Abdominal operation and operations by the vagina. T. Gaillard Thomas in 1869 reported a case of chronic inversion successfully treated by the abdominal method. After median laparotomy the cervical ring was dilated and the fundus replaced. A second case in which the operation was performed on a patient already exhausted from loss of blood ended fatally. Against this operation it is urged that there is grave risk from shock and sepsis when the patient is exhausted, and also that there is great difficulty in satisfactorily carrying out dilation; the soft parts are often injured, and the ring tends to recontract before the fundus can be replaced. Thomas himself recommends the operation only as a substitute for amputation. The points in favor of the method are that adhesions about the inversion-ring can be more easily separated than in the vaginal operation; hemorrhage can be more readily controlled, and a suspension-operation can be carried out as a final step. These points are of little practical importance. Adhesions about the ring are exceedingly rare; hemorrhage is slight after kolpohysterotomy; and suspension can be easily accomplished by vaginal fixation of the round ligaments. Fifteen cases are recorded in which Thomas' operation or a modification of it has been employed. Of these, 8 were successful, although in 3 of them incision of the ring had to be resorted to; in 4 of the unsuccessful cases amputation of the uterus was necessary; in 2 the details were not given, and in 1 the result was fatal. The 4 principal methods of operation by the vagina are: (1) Partial posterior kolpohysterotomy (Küstner's operation); incision through the posterior uterine wall from just above the external os to just below the fundus—6 operations with 4 successes are recorded; (2) complete posterior kolpohysterotomy (Piccoli's operation); incision through the posterior uterine wall from the external os to the fundus—12 operations with 11 successes; (3) partial anterior kolpohysterotomy (Kehrer's operation); incision through the anterior uterine wall from the external os to the center of the fundus—1 operation, successful; (4) complete anterior kolpohysterotomy (Spinelli's operation); incision through the anterior uterine wall from the external os to the fundus—6 operations with 6 successes. No fatal cases are recorded in any of the vaginal operations. The vaginal methods thus show 26 cases with only 3 failures—that is, 88 % of successes as compared with 53 % by the abdominal method. Partial kolpohysterotomy, whether anterior or posterior, although successful in some cases, often fails when the fundus is thickened and hard, and complete incision of the cervix is found to be needful. Spinelli recommends the anterior rather than the posterior operation, on the grounds of an alleged atrophy of the anterior wall in chronic inversion, and of the danger of the formation of adhesions in the posterior operation which would fix the uterus in a retroverted position. This danger appears to be a very real one.

¹ *Am. Gyn.*, June, 1903.

Peterson saw the first of his 2 cases of chronic inversion about 10 years ago, and recommended Thomas' operation. The patient refused the treatment, and he has no record of her later history. In the second case he performed Spinelli's operation independently and with success, and this is the form of operation he especially recommends. In his case some difficulty was experienced in bringing together the edges of the peritoneum after reposition of the uterus. In such a difficulty he approves of Taylor's method of removing a wedge-shaped piece of the uterine wall on each side of the incision, so that both the muscular and the peritoneal layers may be brought into accurate apposition.

FETAL DYSTOCIA.

Gigantism in the Newly Born.—J. Ettinghaus¹ analyzes exhaustively the experience on this subject of the Königl. Charité at Berlin from 1895 to 1901. Among the 13,112 births, 510 were "giants," meaning thereby children with a weight of 4000 grams or over. Comparing the proportion of giants to all births at Dresden and Berlin, the percentages are 2.76, 3.45, and 3.94 respectively, with a maximum for any place and year of 4.54 and a minimum of 2.00. The picture of a giant child calls up that of a powerful and not too young mother, who is not a primipara. Thus, while nearly two-thirds of all mothers admitted fell below 25, less than one-half of the mothers of giants fell below that age, and of the mothers of the heaviest, 52, more than half, were between 30 and 40. A similar result is obtained if one compares primiparas with multiparas. About two-thirds of the mothers of giants fall into the latter class, and in the case of the heaviest children the number of previous pregnancies is, on the whole, the greatest. Heredity appears sometimes to enter as an etiologic factor. Also the statistics reveal the presence in the mothers of giants of unusually large pelves. Respecting the length of time of delivery just in the case of the heaviest children, it is sometimes unusually short. Nevertheless it is, in general, prolonged, an average for the time of expulsion being for the primiparous mothers nearly 3 $\frac{1}{4}$ hours, as against 1 to 2 hours in the normal case; and for the multiparas, 1 $\frac{3}{4}$ hours as against a normal average of $\frac{1}{4}$ to $\frac{1}{2}$ hour. And with giants an expulsion-time of 10, 20, and more hours quite often occurs. As regards the cause of delay, there is here hardly a question of contracted pelves; nevertheless the unusual size of the child makes the pelvis relatively small. In this prolongation of the expulsion-time there is, perhaps, in the absence of contracted pelves, malpresentations, etc., a datum point for the diagnosis of a giant child. And this diagnosis is not unimportant, as in the case of giant children, more than in others, artificial delivery is necessary. Thus in Ettinghaus' series artificial delivery was resorted to in 8.42 %, and in the heaviest, 52, in 15.38 %, as against 5 % in the average run of cases. The reason for this greater need of aid is the size of the child, and not primiparity (the usual cause), as here multiparity strongly pre-

¹ Samml. klin. Vorträge, Med. Rec., Jan. 30, 1904.

dominates. Especially is the size of the head the determinant factor. And in this circumstance, involving as it does nondescent into the pelvis, we have the chief cause of the frequently observed weakness of the pains. An additional evidence that the size of the child is the determinant factor is found in the rarity of abnormal presentations. Also prolapse of the funis is less frequent here than usual, the large bulk of the child filling up the lower uterine segment. Head-presentations occurred in 96.88 % of the cases, as against 93.47 % for normal births. Lacerations of the soft parts during birth are much more frequent than in normal deliveries—especially the higher degrees of such lacerations. And among the mothers of giants, in conformity with the general experience, it is the primiparas which suffer most from these accidents, for while the primiparas were represented only to the extent of 26.64 %, they formed 49.39 % of those suffering from lacerations. The general condition of the mothers during and after parturition was, in general, quite good, which is explicable by their good physique and their being, as a rule, multiparas. As regards mortality, Dubois has found that in 45 mothers of children over 4900 grams in weight the mortality is relatively considerable, though it is not directly dependent upon the greater size of the child. In Ettinghaus' 510 cases there were only 4 deaths, but one of which was directly chargeable to the unusual size of the child. In any case the percentage of mortality was low compared with the average—0.78 % as against 1.09 % for normal births. While the mortality of the mothers is thus small, the case is far otherwise with the children. For though the percentages of mortality for the normal pregnancies and births and those of giants are 8.55 % and 33.92 % respectively, the deaths of giants during parturition are numerous. Thus, while in normal births the percentage of freshly dead children to the whole number dead is 51.58 %,—and consequently that of the macerated 48.42 %,—with giant children the ratio of the freshly dead is 95 %, and the macerated but 5 %. That the mortality is incident to increased size and consequent delay in parturition is shown by the fact that the percentages rise in steady progression with the weight of the child—from 2.79 % for weights between 4000 and 4200 grams to 25 % in the case of those over 5000. As regards the proportion of the sexes, while in normal births the males are to the females as 105 or 106 is to 100, with giant children the proportion is 216 boys to 100 girls. And while the relative mortality is about 55 % for boys to 45 % for girls, with giants it is as 60 is to 40. In Ettinghaus' series, besides those born dead, 6 died some days after birth: all of them had shown objective signs of severe injury, such as cyanosis or deep asphyxia. Also when born 17 more showed signs of being more or less deeply asphyxiated, but soon recovered. Turning now to the children, certainly the most striking fact is the proportion of the sexes, the results at Dresden, Munich, and Berlin averaging about 2½ times as many boys as girls, with extremes of 284 % and 178 %. Nevertheless girls are represented in even the heaviest children, 3 of the heaviest 11 being girls. A surprising result is the average weight for the two sexes—namely, 4285 grams for the

girls as compared with but 4204 for the boys. But von Winckel's results agree, for he found the average weight for the 4 girls to be 4300 grams, while that of the 27 boys reached only 4265. In his series von Winckel found a duration of pregnancy of at least 302 days. On this last point Ettinghaus' data were not precise enough for the expression of an opinion. But the length, weight, and, above all, the considerable development of the skull speak for a long duration of pregnancy. Not fewer than 77 had a head-circumference of more than 38 cm., and the several diameters were enlarged correspondingly. Ettinghaus then gives a table showing the most important data in the principal cases in the literature of births of children of 5000 grams or over. The average age of the mothers is about 34 years, and the same law holds, as in his own series, as regards the proportions of primiparous and multiparous mothers. His experience is also confirmed in other particulars. Out of the 25 cases cited, the children in 7 were perforated or delivered by laparotomy. Of the 18 cases in which the fate of the child is recorded, two-thirds were born dead, 11 of the 12 dying during birth. The boys were $3\frac{1}{2}$ times as numerous as the girls.

Frequency and Diagnosis of Twin-pregnancy.—Seeger¹ contributes an interesting paper upon this subject from the records of Olshausen's clinic in Berlin. In 15,977 births twins occurred in 233, or 1 in 68.6 births. In the great majority of cases pregnancy had advanced a little beyond the eighth month. A positive diagnosis before labor was made in 43.3 %. In nearly all cases the presentation of the twins was stated. Both presented by the vertex in 46 %. In 34 % one child was in vertex and one in breech presentation. In 8 % both children were in breech presentation; in 8 % one child presented by the vertex and one transversely; and in 4 % one child was in breech presentation and one in transverse presentation. In 67.3 % the children were of the same sex; in 32.7 %, of unlike sex. In 75.4 % the twins were duovular, and in 24.6 % they were uniovular. So far as obstetric operations went in these cases, they were necessary in 41.6 %. Of these, the forceps was used in 51 %, extraction alone in 35 %, and version and extraction in 23 %. Complications occurred in a considerable percentage of cases. Of these, most frequent was eclampsia—in 12.88 %; next was hemorrhage—in 11.16 %. In making the diagnosis more reliance was placed upon the detection of 3 great fetal parts by palpation. Next in value as a diagnostic sign was the recognition of 2 heart-sounds. *Ahlfeld's sign*, which consists in measuring from the lowest presenting part to the fundus of the uterus, was also employed. When this distance was more than 30 cm., the probable diagnosis of twin-pregnancy was made. *Keilmann's sign* was also present. This consists in examining to determine fluctuation in the amniotic liquid. In polyhydramnios fluctuation is distinctly felt when the finger is carried against the membranes, while in twin-pregnancy this is not the case. Another interesting sign of twin-pregnancy is prolapse of the umbilical cord without rupture of the membrane.

¹ Zeit. f. Geb. u. Gyn., 1903, Bd. xlix, Heft 2.

Quintuple Twins.—A genuine case of quintuplets has recently been reported before the Berlin Obstetrical Society by Nijhoff¹ (Groningen). The mother was 34, and came of what may be called a "very twin-bearing" stock. Her own mother had once borne twins, the wives of 2 of her maternal uncles had each borne twins once, and one maternal aunt had been the mother of triplets. Twin-pregnancies were unknown in the patient's father's family. The patient herself had given birth to a healthy boy 7 years before. She believed that she aborted at the second month in 1902, then she menstruated once,—on January 20, 1903,—and immediately afterward became pregnant. During gestation she felt well, but the abdomen grew unusually large. After the beginning of May a little blood and serous fluid occasionally escaped from the vagina; quickening was noticed early in June, and on July 12 she gave birth, within an hour, to the 5 children and the placenta. None survived their birth. The first and the second child were female, the third a male, the fourth and fifth females. The first and third fetuses were enveloped in their membranes when delivered. The first and third were head-presentations, the others, footlings. The placenta followed the fifth child within a quarter of an hour, after gentle pressure. There was a considerable amount of flooding, and many coagula came away during the puerperium, but recovery was rapid and complete. The obstetrician, De Blecourt, who delivered the children, took care to invest each fetus at once with a band on the arm bearing a number and to mark its funis. The quintuplets and placenta were preserved in formol, each child being reunited to its funis. The placenta was single, but divided into 3 unequal parts, with irregular disposition of the chorion and amnion. Freund, in discussing Nijhoff's case, noted that he had attended one case of quadruplet pregnancy in which 2 of the children were living, and one was a *fœtus papyraceus*. Hollander, he added, had observed an authentic case of quadruplets, but the alleged sextuplets born in Silesia proved to be spurious, which we can well understand. Olshausen remarked that the Dutch were a prolific nation, as Nijhoff's case helped to show. He himself knew of a family in which the women had on 3 occasions borne triplets, and had no fewer than 25 times given birth to twins. Nijhoff expressed his intention of shortly issuing a monograph on quintuplets. He shows that the only preparations illustrating the condition which have been preserved are in the Museum of the Royal College of Surgeons of England and in a Dublin collection, though in neither is the placenta preserved. [We find that there are 2 specimens of quintuplets in the Museum of the Royal College of Surgeons, neither with the placenta. The first (No. 3,681, Physiologic Series) is Hunterian; the second (No. 3,681 A) was presented by Dr. Arthur Farre in 1877. All the fetuses are females.]

¹ Brit. Med. Jour., June 25, 1904.

OBSTETRIC OPERATIONS.

[Our views as to the indications for the various major operations in obstetrics have changed materially during the last few years. Porro's supravaginal amputation of the cervix after removal of the child was popular for many years after its introduction in 1876. Since, however, Sanger introduced his method of performing cesarean section in 1882, the Porro operation has rapidly lost ground. One of the supposed advantages of the Porro with the extraperitoneal treatment of the stump was that it could be more easily performed by a general practitioner who was not an expert abdominal surgeon. It was also considered a safer operation when there was infection. The surgeon of to-day, however, does not attach much importance to these considerations, and generally thinks it a very unsatisfactory, if not a crude, operation. Symphysiotomy is also fast losing its short-lived popularity. In a late report, Tessier, of Paris, gave notes of the histories of 20 women who had been delivered by symphysiotomy during the period 1898 to 1903 (February). The patients were operated on at 7 different hospitals. Four only out of 20 escaped without some undesirable sequel, the remaining 16 being more or less damaged by the operation. One patient has been a chronic invalid for 5 years; 8 suffered from phlebitis; 10 had urinary trouble during months or years, incontinence of urine being the most common affection. A number had difficulty in lifting or in going upstairs. A few years ago an operation was, in a large portion of cases, considered successful when it did not cause the death of the patient. Many of the operators were not frank, or at least prompt, in reporting the disastrous results of symphysiotomy, such as those mentioned by Tessier. While it has many disadvantages, it is doubtful if it has one advantage over cesarean section. From the present trend of obstetric surgery it seems not unlikely that Porro's operation and symphysiotomy will be considered obsolete in the near future. It is to be hoped that all forms of embryotomy of the living child will be placed in the same category. Cesarean section is now becoming very popular in skilled hands: its mortality has been diminished to such an extent that it is now placed at 3% or 4% in cases in which women have not been infected before the operation.]

Hebotomy.—D. B. Hart¹ writes that by hebotomy is meant a section of the os pubis to one side of the symphysis. The case of Hart was presented before the Edinburgh Obstetrical Society, February 10, 1904. The operation has been recently revived, and is proposed as a substitute for symphysiotomy. It is adapted for cases in which the pelvis is flat, where forceps or turning is impracticable, and where the conjugate diameter is below 3½ inches. In these cases it has been customary to do symphysiotomy, which is resorted to in cases of flattened pelvis where the conjugate has a diameter of 2¾ inches. When the pelvis is further narrowed in this diameter, cesarean section or craniotomy is alone

¹ Lancet, Feb. 27, 1904.

available. The chief objection to symphysiotomy is the difficulty of insuring asepsis, the possibility of injury to the neighboring structures, and the risk that the resulting union may not be immovable. Hebotomy is the lateral section of the body of the os pubis, avoiding the symphysis. The objections to symphysiotomy do not apply to this operation, which has been newly revised by Gigli, who uses a special wire saw for the operation. An oblique incision is made through the soft parts down to the os pubis; a director is passed behind the body of the bone, keeping close to it, and afterward the special wire saw. The saw divides the bone rapidly and easily. Any bleeding is readily controlled by pressure. After section the pelvis opens out, and after delivery the periosteum is stitched together, and then the skin-wound closed. A binder is firmly applied, and sand-bags arranged at the sides of the pelvis. Details of a case were given in which a first confinement was terminated by craniotomy, but on a second confinement hebotomy was tried, and the child easily delivered with forceps. The advantages of hebotomy over symphysiotomy are: (1) It is easier and more rapidly performed; (2) the bladder and urethra and a part of the anterior vaginal wall retain their natural support; (3) extension of the wound into the vagina is less probable, as the soft parts are thicker laterally than in the center; (4) for this reason and because the clitoris is avoided there is less hemorrhage; (5) the wound does not communicate with the vagina or vulva; this is a great advantage in septic cases; (6) union is more rapid and effectual between bony surfaces than in the case of a joint, such as the symphysis, and there is less danger of suppuration; (7) in a subsequent labor hebotomy may be performed on the other side, while a second symphysiotomy is difficult and dangerous on account of adhesions between the bladder and the posterior surface of the symphysis. The results of this operation have been brilliant. In the 12 cases reported all the children have been born alive, and all the mothers have recovered without any disturbance of gait. In one case the operation was performed in a hovel, and in several after the onset of septic infection. In one case the true conjugate was only 3 inches. Perhaps the greatest advantage of hebotomy is that if, after the operation, the pelvis is not too tightly bandaged, a permanent increase in its capacity may result. The gap between the severed ends of the os pubis becomes filled with callus. The pelvis is larger, though somewhat asymmetric, the clitoris and urethra being displaced to the right. [This operation is open to all the objections, save, perhaps, that of sepsis, that pertain to symphysiotomy, and should make place for the safer and better cesarean section.]

Vaginal Cesarean Section.—Dührssen¹ continues to advocate very warmly this method of rapid delivery by deep cervical incisions or by vaginal cesarean section. About 100 cases of the latter operation have now been reported, and Dührssen considers it one of the most desirable means of rapidly emptying the uterus, particularly in eclampsia. In cases in which some dilation has already taken place, so that the internal os is obliterated, 4 incisions carried up to the vaginal vault will usually

¹ Zent. f. Gynäk., Apr. 2, 1904, No. 13.

give abundant room for delivery. To avoid complications it is important to make the posterior incision first. When the cervix is wholly undilated, splitting up of the anterior and posterior uterine walls, together with the anterior vaginal wall, can be safely performed by any gynecologist, and makes delivery easily possible. The posterior incision is an essential part of the technic, and the difficulties some authors describe have been largely due to attempts to deliver through only an anterior incision. Prophylactic nicking of the perineum is also often necessary in primiparas in order to save injury to the pelvic floor. Dürrssen has not given up the use of the metreurynter, however, but always makes a trial with it before resorting to the more radical procedures to which his name is attached.

Ruhl¹ has performed this operation 19 times, and points out the necessity for one step which is not usually emphasized: this is that the cervix should be bluntly dilated as much as possible before beginning the incision. If this is not done, the cervix after the sutures are laid will often be even tighter than before, and retention of the lochia is sure to occur. Preliminary dilation also renders a less extensive incision of the anterior uterine wall sufficient for extraction, and therefore fewer sutures need be placed. Another point of importance is that the proper cellular plane be followed in dissecting up the bladder, as much hemorrhage can be avoided in this way. Cases in which a former vaginofixation has been done are extremely difficult, and to avoid injury to the bladder the old line of incision must be followed close. The parts are also very inelastic in these cases, so that a long incision through the anterior uterine wall is necessary.

PATHOLOGY OF THE PUERPERIUM.

Bacteriology of the Puerperal Uterus.—Marx² discusses the following problems: (1) Is the puerperal uterus a sterile organ? (2) In what way does a uterus free from bacteria influence and assist us in diagnosing a nonseptic condition? (3) As a result of these investigations, how is our treatment of the parturient state to be influenced? Fifteen puerperal women were examined by means of culture-tubes, 48 bacteriologic tests being made altogether, the observations being begun on the day of labor and extending through the first 5 or 6 days of the puerperium. He concludes that the puerperal uterus is a sterile organ. The presence of bacteria in the puerperal uterus in the absence of general evidence of a constitutional disturbance, such as fever, pulse-rise, and the like, means the introduction of such bacteria by accidental contamination. The presence of bacteria in the puerperal uterus accompanied by fever, rapid pulse, and other disturbances means in all probability a sepsis arising from the uterus. The absence of bacteria in the presence of general symptoms indicates the necessity of looking for the source of the disturbance in some organs other than the uterus—sepsis from the vagina or some other general disturbance independent of the puerperal

¹ Zent. f. Gynak., 1904, No. 2.

² Am. Jour. Obstet., Sept., 1903.

condition. Practically, he feels that a systematic examination of the contents of the uterus from the standpoint of bacteriology is a very useful procedure, whose field of application is very small—limited to those few cases in which one is unable to make a diagnosis by other means, and further limited to those cases in which the cultures can be made by one who is an expert in this line of work. The vagina and uterus being normally sterile, Marx argues that in the healthy woman the only part of the genital tract needing preparation for labor is the vulva. When the asepsis of the operator cannot be questioned, no uterine or vaginal douche is necessary or advisable before, during, or after labor. On the other hand, when the vaginal secretion is alkaline, profuse, malodorous, and purulent, which in most cases means a gonorrheal infection, profuse and repeated douches are given before labor, and when labor sets in, if the discharge is still not normal, surgical scrubbings, such as are done before a major vaginal operation, are indicated. When in these pathologic cases labor is prolonged, vaginal douches are administered at short intervals. He does not believe in the use of gloves, depending instead on thorough hand-disinfection. Marx believes that even in cases of known infection uterine douching is of no service in eliminating infection, and he advocates, instead, the firm packing of the uterus with iodoform-gauze.

Gonorrhea in the Puerperium.—[There is a considerable divergence of opinion as to the influence of gonorrhea on the puerperal state, some claiming that the disease has very little effect, others that considerable disturbance may be caused.] A. Martin¹ reports 13 cases of chronic gonorrhea which he kept under observation during their labor and puerperium. In none of these cases were any symptoms present which could be attributed directly to the venereal disease. In addition they seem to confirm the assumption that so-called chronic gonorrhea is no barrier to pregnancy; in most instances even when there is a localization of the disease in the cervix, or, as in one of the cases, there is present a gonorrheal salpingitis. In none of these patients did abortion come on. In 12 cases the labors were favorable, in one of which an acute exacerbation of the gonorrhea may have had some influence in hastening the labor by the rise of temperature. In the remaining case extensive adhesions of the placenta delayed the third stage, but subsequent examination showed that this condition was not due to the gonococci. In 4 cases the puerperium was practically normal; in the remainder there was a rise of temperature, coming on rather late, and this Martin considers a characteristic of gonorrheal infection. Involution, moreover, did not appear to be interfered with and no perimetritic involvement occurred, such as has been noted in the acute cases. Although he considers that the relation of gonorrhea to pregnancy must still furnish a doubtful prognosis, Martin does not agree with most authors who assume that it is "*ad malem vergens*." The treatment should be limited to local douching with normal salt-solution, to which antiseptics may be added, but the most satisfactory results were obtained from applications of sterilized

¹ Berl. klin. Woch., Mar. 28, 1904.

yeast both to the cervix and to the urethra. When gonorrhea is recognized as the cause of disease in the adnexa or the uterus, radical operations should be resorted to with caution, and the hope of spontaneous cure should not be abandoned too early. In isolated instances the severity of the complications must necessarily be taken as the guide; and when operation is called for, he considers that evacuation of the pus through the vagina is the most satisfactory.

Puerperal Metrophlebitis.—[A number of surgeons have recommended, and carried out with more or less success, a method which consists of ligating or excising thrombosed veins due to puerperal pyemia. Trendelenburg adopted an extraperitoneal approach to the hypogastric vein and reports a successful case. Sippel recommended, in cases in which the uterus was removed for pyemia, that the neighboring veins be followed up and excised; this, of course, by the abdominal route. The former advises doing the operation after the second chill; the latter, not until the chills have recurred several times. Trendelenburg thinks it is essential that the hypogastric vein should be ligated, because in a series of 21 autopsies on cases of thrombophlebitis he found the hypogastric involved about twice as often as the spermatic.] Grossman¹ has lately made a more extensive series of autopsies in order to determine the relative involvement of these veins. Among 51 cases there were 14 with thrombophlebitis, 24 with lymphangitis, and 13 in which both forms were combined. He also found that in the majority of cases veins besides the hypogastric were thrombosed. In only one case could the operation advised by Trendelenburg have been done. A previous diagnosis had been made in only 9 instances. The course of the disease in all cases in which there is a simple thrombophlebitis is a protracted one, lasting several weeks or months, while in the majority of cases in which a lymphangitis is present the fatal result comes on in a few days. Another noticeable feature in this series of 51 cases was the fact that in all some divergence from the normal course of labor was present. Grossman does not believe that the mortality in puerperal pyemia will be much affected by the introduction of this operation, but thinks that the effort is a step in the right direction and further research should be encouraged.

Collargol in Puerperal Septicemia.—Rosenstein² finds that the means at hand for treating puerperal septicemia in private practice are unsatisfactory, and, after mentioning some of the newer methods which have been recommended, such as nuclein and common salt, antistreptococcus serum, and the intravenous injection of corrosive sublimate and of formalin, deals with the injection of soluble silver into the veins, according to Credé. Collargol exhibits a considerable bactericidal action, and is said to be capable of being absorbed from the skin in the form of an ointment. Rosenstein met with some difficulty in injecting collargol intravenously at first, and therefore injected it subcutaneously instead. This procedure, however, produced so much pain that, in spite of good results, he again tried the intravenous injections, and found the following method satisfactory: The skin of the flexure of the elbow is disin-

¹ Arch. f. Gyn., vol. vii, No. 3.

² Therap. Monatsh., July, 1903.

fectured with ether or benzene, and a few turns of a bandage are applied to the upper arm, until the cephalic vein becomes visible and palpable. The syringe must have a special arrangement so that the needle is held tightly on to the main part and is filled with 10 grams of a 1 % solution of collargol; the needle is then driven into the vein. There must be no air in the syringe. One can tell that the needle is in the vein by the appearance of a few drops of dark blood, and by the facts that, on emptying the syringe, no pain is produced and no tumor appears. He uses a needle which has a small stop about 4 to 5 mm. from the point, which prevents the needle from entering further into the vein and damaging its coats when the patient moves her arm or when the bandage is removed. Rosenstein states that he has obtained very good results with this method of treatment, and exemplifies this by relating the history of one of his cases.

The Iodin Treatment of Puerperal Sepsis.—The late W. R. Pryor¹ contributes the result of his experience of septic cases treated by opening the vaginal vault and the introduction of iodoform-gauze into the pelvis. In every case of puerperal streptococcal endometritis streptococci were found free in the pelvis, and in over 97 % of cases they were present in the uterine contents. After cleansing out the uterine cavity he opens the posterior culdesac and packs both with large quantities of iodoform-gauze. In nearly all cases, after this procedure, cocci will be absent after the third dressing. The iodoform acts by causing local iodism, and it is this that sterilizes the pelvis. Pryor reports 37 cases treated by this method, 27 of which had had no previous operation and only 1 died, while 10 had been previously curetted by others and 3 died. In all the cases enteroclysis or intravenous infusion accompanied the operation to aid in eliminating the iodine and toxins by the damaged kidneys. In a later article,² in commenting on the morbidity of the cases treated by this method, in his own work and by others, Pryor says: "We have found that 6 of the subjects have subsequently conceived, 5 going to full term, 1 inducing abortion at the fifth month. Contrast this treatment with that of curetting alone, with a mortality of 22 %; anti-streptococcus serum, mortality of 33 %; hysterectomy, mortality 55 %; and the let-alone treatment, mortality of 7 % to 25 %, and we have nothing for which to apologize. But there is another phase to the subject. All the women we have operated on and who have lived have kept their uteri, and 6 that we know of have had a restoration to physiologic function."

The Operative Treatment of Puerperal Mastitis.—Hofmann³ describes a new method of dealing with puerperal abscesses of the breast, which is advocated and practised by Bardenheuer. The usual operative treatment of this affection by free incision and drainage is open, it is held, to the objections of prolonged after-treatment and of superficial and unsightly scarring of the exposed surface of the breast. In the method described by Hofmann a free semicircular incision is made along

¹ N. Y. Med. Jour., Aug. 22, 1903.

² N. Y. Med. Jour., Jan., 1904.

³ Zent. f. Chir., 1903, No. 31.

the lower margin of the breast, which structure, together with the surrounding fat, is detached from the fascia of the pectoralis major, and held upward by blunt hooks. The abscess is then attacked from behind, and after it has been opened by free incisions, made in the usual radial direction from the nipple, is drained by one or more tubes brought out at the external angle of the wound, the inner and middle thirds of which are closed by sutures. This method, Bardenheuer teaches, is indicated in cases of submammary abscesses and of large abscesses in the parenchyma of the gland, and also for the removal of circumscribed nonmalignant tumors of the breast. A somewhat similar operation is recommended for prepatellar bursitis. A semilunar incision parallel to the lower margin of the patella is made below the inflamed and swollen sac, which, after the flap of skin thus formed has been dissected upward, is "shelled out." The flap is finally replaced and secured by sutures.

PHYSIOLOGY AND PATHOLOGY OF THE NEWBORN.

Temperature of the Newborn.—M. S. Pembrey,¹ in a general summary of bodily temperature, gives some valuable data on heat-production in the newborn. The temperature of pups, kittens, and rabbits falls rapidly after they are born until it reaches a point only a few degrees above the temperature of the air. Newly born guineapigs are able to maintain their temperature if the cold is not excessive. Young warm-blooded animals can be divided into 2 classes—those which at birth are blind, helpless, and in some cases naked, and unable to regulate their temperature, and those which are born better developed, coated with fur, and capable of maintaining their temperature at a fairly constant level. The practical interest of these observations on animals relates to their applicability to the human infant. Raudnitz has studied the temperature of children immediately after birth. Cold affusions at this time will cause a rise of rectal temperature in strong infants, but the body-heat remained stationary or fell in those who were weakly. Heat-radiation was only a secondary cause of the radiation of bodily temperature; the chief cause was the imperfect power of regulating the body-heat, which is imperfectly developed in the newly born. The practical deduction from these observations is that the bodily temperature of the newly born should be carefully conserved. Premature and weakly infants may be reared by maintaining their temperature. Cold, even moderate cold, to such premature infants is a depressant and not a stimulant, for they can regulate neither the loss nor the production of heat.

Obstetric Paralysis.—In the infant the earlier writers appear to have assumed that this injury was due to direct pressure on the nerves, says William Thorburn.² Pressure on the neck, however, is incompetent to injure the lower roots of the plexus, while pressure in the axilla would not select for injury the fifth and sixth roots only. The appearance of the Duchenne-Erb paralysis at the time of birth is not very common; statistics quoted by Duval and Gullain, showing that it may be

¹ Brit. Med. Jour., Feb. 27, 1904.

² Brit. Jour. Obstet., May, 1903.

expected about once in 2000 births, and that in the vast majority of cases delivery has required some operative interference, while nearly one-half have been breech presentations. Lateral stretching will obviously bear most heavily upon the upper cords of the plexus, and will thus explain the selection for injury of its fifth and sixth roots. This brings the causation of obstetric paralysis of the Duchenne-Erb type into line with that of rupture of the entire plexus, and allows the assignation of all cases to direct traction, the only difference being that in the former the plexus is stretched by deflection of the head, whereas in the latter the impact is more commonly received upon the shoulder. The prognosis of injuries of the brachial plexus, whether obstetric or otherwise, is unsatisfactory, and Bruns has recently shown that of all cases of partial injury, only 26 % recover, whereas 66 % of similar injuries to single nerves below the plexus undergo spontaneous cure. The treatment of obstetric paralysis has, until recently, consisted solely in the use of warmth, massage, galvanism, and the like. In cases of the Duchenne-Erb type arthrodesis at the elbow may be of service, but though this measure was suggested in 1886, it is not known that it has been actually carried out by any one. Of primary suture of the plexus and its root there are numerous cases. Kennedy has now extended the operation to obstetric paralysis, and reports 3 cases, in all of which the cicatrix was situated at the junction of the fifth and sixth cervical nerves. The first operation was performed 2 months after birth, the second 14 years after, and the third 6 months after, and suggests 2 months as a reasonable period to wait for spontaneous recovery. The result was excellent, but the operations had been of too recent a date to judge what the final outcome of the cases might be. On the evidence before us it may be safely assumed: (1) That in the vast majority of cases of obstetric paralysis the cicatrix will be found in accessible places at the junction of the fifth and sixth roots; (2) that recovery without operation is highly doubtful, and is certainly not to be expected unless marked improvement occurs within the first 2 or 3 months; (3) that if marked improvement does not occur within this period, the plexuses should be exposed; (4) that perineural cicatrices should be removed and the nerves resected unless they are free from internal callus; and (5) the results of such operations are likely to be favorable.

Acute Contagious Pemphigus in the Newborn.—Before the Obstetrical Society of London, at its meeting on November 4, 1903, Maguire¹ read a paper upon this subject. Most authorities consider pemphigus in the infant usually the result of syphilis. He reported the cases of 18 infants suffering from acute contagious pemphigus, among whom 8 deaths occurred. From the study of these cases he concluded that a common contagion of unknown septic origin was conveyed from case to case by a certain midwife. The contagiousness was proved when the number of cases infected from each infant was ascertained. In 2 of the cases bacteriologic examinations revealed the presence of *Staphylococcus pyogenes aureus*. The secondary symptoms were those of acute

¹ Brit. Med. Jour., Nov. 14, 1903.

toxemia, the infection having gained entrance through the unhealed umbilicus. Maguire concludes that while this comparatively rare disease usually attacks the newborn, it may also be found in older children and adults. The eruption was bullous, variable in distribution and extent, and the specific germ was found in the contents of the vesicles. In mild cases no other symptoms than the eruption were present. In grave cases there was a general infection, with an acute toxemia, which invariably ended fatally. The unhealed umbilical scar gave access to the poison in these cases. No method of treatment employed influenced the course or termination of the disease. In discussion, Cullingworth had seen a case in an adult when it was very difficult to recognize the source of infection. Dickinson referred to an epidemic of 14 cases in the Foundling Hospital at Parma. Most of these cases were fatal, and an examination of the blood showed a marked leukocytosis caused by this specific organism. Syphilis had nothing to do with it. He did not believe that infection through the umbilicus was the cause of the toxemia, as cases in adults could not be explained in this way. MacLeod had observed the increasing rarity of this disease, and believed it due to the general use of antiseptic precautions in maternity hospitals. He believed that the streptococcus was the cause of the infection. In determining the germ he has used the method of Sabouraud, of Paris, who aspirated the bullas into a sterile pipet containing ascitic fluid. By this means MacLeod obtained streptococci in pure culture in a fatal case. He referred to the close resemblance of the disease to impetigo, whose cause had been found to be *Streptococcus pyogenes*. He described a case in which an abrasion of the skin at the lip had been the point for the entrance of infection. He thought that usually a diagnosis could be readily made between this disorder and syphilitic pemphigus. A form of hereditary pemphigus, the result of vasomotor disease, might occasion difficulty in differential diagnosis.

GYNECOLOGY.

By J. MONTGOMERY BALDY, M. D.,
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SUMMARY.

THE most noteworthy tendency observable in gynecologic literature published in the past year is that of conservatism, the number and the importance of articles advocating conservative methods being unusually great. The note is specially strong in diagnosis, prognosis, and most particularly in articles treating of operative procedures. The only marked deviation from the general principle is that of Fowler's work upon the localization of postoperative septic foci in the pelvis, and Heis' theory of the so-called nasal dysmenorrhea, with case reports from an interesting study by Ries. The causes of sterility and of the diminishing birthrate have received much consideration. Perhaps the greatest interest has been evinced upon the lines of preventive medicine, and if any one subject has been elevated into greater prominence than another, mention must be made of carcinoma of the uterus. There has been a revival of interest in the use of pessaries, which has led to the publication of several papers on the subject. Several papers of importance have also appeared relating to the part played by the fallopian tubes in menstruation, and relating the conclusions of several observers in a number of cases.

PRELIMINARY AND GENERAL CONSIDERATIONS.

Diminishing Birthrate.—J. W. Taylor¹ gives statistics showing the decreasing birthrate in Great Britain and Ireland; also in the countries of western Europe, notably France, while in Russia and Japan it is increasing. There is no method of artificial prevention that can be regarded as innocuous. The prevention of pregnancy is not the gain to the woman that so many imagine. During the period of pregnancy and lactation there is a time of rest and comparative inactivity for the ovaries and ample opportunity for the nervous supply of the ovary to recover from any undue stimulus, and if this natural cycle has been artificially prevented, the ovaries suffer and the woman suffers with them.

Race Suicide from a Gynecologic Standpoint.—R. H. Grandin² says that the race is suffering from the effects of suicide far more because

¹ Brit. Gyn. Jour., May, 1904.

² Med. News, July 9, 1904.

of inaptitude for conception than from disinclination to assume the obligations of maternity. Disease of the reproductive organs is the medical side of the problem. Grandin considers that the chief cause of race suicide is the gonococcus; that 45 % of sterile marriages are traceable directly to gonorrhea. The evil should be exterminated by preventive medicine—that is, by the education of men and women in the evils entailed by venereal disease.

Sterility.—Martin¹ warns against the diagnosis of sterility in women without examination of the semen of the husband. He gives the cause of sterility in women as displacement of the uterus, endometritis, fluctuation of the uterus, strictures of the uterine canal, atrophy of the genitalia, abnormal secretions, atonicity of the sexual apparatus. Of these, the most common cause is probably retrodisplacement of the uterus. The other causes are given in their order of importance. He advises electricity for most of the conditions causing sterility. In a discussion before the Dutch Gynecological Society, Kouwer² stated that in 700 cases sterility was noted in 101, impotence in the husband being the cause in 11. He had been successful in treating less than one-half (24) the cases. Out of 188, Treub had noted 39 cases in which the husband was at fault. In 80 cases occurring in married women in which the semen was examined, he found azoospermia in 25 and oligospermia in 12. Balin³ examined the semen of the husband in 200 cases of sterility in which no cause could be found in the wife. His conclusions were as follows: (1) In 36 (18 %) there was azoospermia, and in 19 % oligonekrozoospermia; (2) of the cases of azoospermia, 63.3 % were due to gonorrhea acquired before marriage; (3) in over one-half of the cases the husband was suffering from the disease at the time of marriage; (4) latent or manifest gonorrhea is the most frequent cause of sterility.

Sterility from Vaginal Causes.—J. N. West⁴ classifies the vaginal causes of sterility as congenital, pathologic, traumatic, and psychic. Congenital causes are pseudohermaphroditism, congenital absence of vagina, vaginal septums and bands, congenital atresia, and other congenital malformations, including imperforate hymen, many of which yield to judicious surgical interference. Pathologic causes are the most frequent and important of the vaginal causes of sterility, and include newgrowths, carcinoma of the cervix, sarcoma, vaginal cysts, fibroids, syphilitic growths, and inflammatory conditions resulting in abnormal secretions inimical to the life of the spermatozoa. Among the traumatic causes, vesicovaginal fistula is the most striking. Cystocele, rectocele, and complete procidentia may also be the causes. Atresia of the vagina due to disease or trauma also occurs and may be a bar to normal insemination. The relief of the traumatic causes of sterility offers a wide field of usefulness to the gynecologist, but when sterility is really due to psychic causes, the physician can offer practically no relief, the means for this lying with the affected individuals.

¹ Clin. Rev., July, 1903.

² Zent. f. Gynak., 1903, No. 25.

³ Zent. f. Gynak., 1904, No. 2.

⁴ Med. News, July 9, 1904.

Sterility Due to Abnormal Conditions of the Uterus.—H. N. Vineberg¹ says that the most frequent causes of primary sterility are arrested development of the uterus; the infantile uterus with a long cervix and small body anteflexed upon the cervix; and congenital retroversion of the uterus in which both body and cervix are comparatively long and slender. Other malformations are conic cervix and pinhole os. Another cause of uterine sterility is endometritis of gonorrheal origin. The most frequent uterine conditions giving rise to secondary sterility are chronic metritis and very deep lacerations of the cervix; others are permanent hyperinvolution and atresia of the uterus.

The Relation between Fibroids and Sterility.—Ansterlitz² analyzes 339 cases of uterine fibroids; he finds primary sterility in 20.23 % and secondary in 21.25 %. This compares significantly with 4.17 % and 13.68 % in women without such newgrowths. He could not demonstrate that sterility was directly due to fibroids. Further analysis gave him 51.2 % of primary sterility in women with interstitial tumors, 22.2 % of the mixed variety, 16.9 % subserous, and 12.7 % submucous.

A Modified Method of Producing Female Sterility Employed on Account of Rare Disease.—P. Rissmann³ describes a method of sterilization used by him in the case of a woman afflicted with convulsions, either of epileptic or hysteric origin. He makes a posterior vaginal incision and excises the uterine portion of both tubes.

Gonorrhea in the Female.—A. N. Alexandroff⁴ presents the present condition of knowledge. He takes a position in prognosis midway between those who assert that the disease can be radically cured in the initial stages, and those pessimists who, like Noeggerath, look upon gonorrhea in women as incurable. Among the therapeutic measures recommended are the usual drugs and means, and, as a novelty, the warm praise bestowed on the efficiency of the electric current in killing the gonococci. A. P. Stoner⁵ says: In the human body the gonococci may lie dormant for years and then produce virulent infection, though in the majority of cases after the infection has existed for a certain length of time the gonococci disappear spontaneously. The urethra offers the most fertile soil for these microorganisms; next, the uterine cavity beyond the cervix. This, once invaded, the tubes rarely escape. The vaginal tract is the most resistant to all infections, as germs are killed by the secretions of the vagina in its normal state. During the early stages of gonorrhea cleanliness and rest should be procured. Vaginal douches are often harmful, in that they spread the disease. Pus formed in the urethra of a previously healthy woman is an almost certain sign of gonorrheal infection. If examination of vaginal discharges proves negative, douches are contraindicated and treatment should be directed wholly to the urethra and vulva. A pad of absorbent cotton should be snugly tucked between the labia and changed as often as soiled, and

¹ Med. News, July 9, 1904.

² Prager med. Woch., 1903, Nos. 23 and 24.

³ Zent. f. Gynäk., Dec. 12, 1903.

⁴ Jour. Akonsherstwa, Oct., 1903.

⁵ Am. Gyn., Nov., 1903.

the outside parts douched with tepid water. After the second week a 2 % to 4 % solution of protargol or a 15 % solution of argyrol may be instilled into the urethra. Should the infection extend to the uterus, a general siege now begins, which usually ends by the intervention of the surgeon and the entire removal of the diseased organ. If the tubes and ovaries must be removed, Stoner believes in removing the uterus also, especially in gonorrheal infection. Otto Abraham,¹ as the results of experiments upon 4 kinds of microorganisms with yeast, is of opinion that these show that **yeast is capable of destroying the vitality of the gonococcus** in 6 hours, of the streptococcus in 48 hours, and of the staphylococcus in 40 hours. Under clinical conditions some modification of the result is shown, and the time for destruction of the microorganism is considerably increased. Still, in 27 cases of cervical catarrh put under yeast treatment, a complete cure was obtained in 20 cases. Abraham does not consider it probable that the yeast-cells cause an endometritis or increased inflammation, since microscopic examination of vaginal secretions after an application of yeast has shown that the yeast-cells lose their strength after a very short period.

Martin,² in the 191 cases operated upon for **pus-tubes in childbed**, examined 97; in only 14 of these did he find the gonococcus present. From his observations he is able to say that, in spite of a chronic gonorrhea, pregnancy may occur and terminate at term.

Tuberculosis of the Female Sexual Organs and the Peritoneum.

—J. Veit's researches and observations concerning tuberculosis of the female genitalia and peritoneum, as translated by Chas. P. Noble,³ lead him to conclude that genital tuberculosis is more frequent than was formerly supposed. Primary genital tuberculosis certainly exists, but the secondary form is more common. Genital tuberculosis usually descends; rarely ascends. The infection may follow the blood-paths or the lymph-glands. In primary isolated cases the best method of treatment is operation. In secondary and diffuse tuberculosis general treatment is better. The best of all palliative agents locally is iodoform. Tuberculosis of the peritoneum is always secondary; it may be ascitic or adhesive. Genital disease may precede or follow it. Nodular peritonites, not explainable by reason of ovarian tumors or carcinoma, are tuberculous. The disease may heal spontaneously. It is often cured by laparotomy. Failures are usually due to tuberculosis elsewhere. It is probably due to the influence of blood-serum. The treatment is operative; radical operations should not be performed unless an isolated genital tuberculosis exists.

Uterine Disease and Constipation.—Capaldi⁴ produced complete fecal retention in guineapigs by sewing up the rectum, and in every case after a time a migration of *Bacillus coli* from the intestine into the peritoneum and uterus was to be observed. No bacilli were found in the blood. In the endometrium distinct evidence of slight inflammation, undoubtedly due to the presence of micro-organisms, could

¹ Zent. f. Gynäk., Feb. 26, 1904.

² Berl. klin. Woch., 1904, No. 13.

³ Am. Gyn., Sept., 1903.

⁴ Arch. di Ostet. e Ginecol., 1903, An. x, No. 8.

be made out. Blood infection occurred only much later. Possibly some cases of abortion in association with constipation may be explained by migration of *Bacillus coli*, and Capaldi relates some experiments in gravid guineapigs which give some support to this hypothesis. The conditions of the experiments differ so much from those of constipation as usually seen in practice that too much value cannot be given to them; they, however, suggest that, in addition to symptoms due to absorption of putrefactive products, some phenomena may be due to local migration of bacilli into the female genital passages. An editorial in *American Medicine*¹ draws attention to the frequent causative influence of uterine displacement and inflammation upon chronic and intractable constipation. The article quotes 4 cases reported by Marchae, in all of which a constipation which did not yield to any form of treatment directed to the gastrointestinal tract was eventually found to be dependent upon a preëxisting displacement of the uterus and was cured upon the correction of the displacement. The conclusion is reached that in all obstinate cases of constipation in the female lesions of the uterus should be suspected and appropriate treatment instituted. Grace P. Murray² says rectal constipation in women may be due not only to the ordinary causes of constipation, but to others peculiar to sex. The various malpositions of the uterus are a cause; and, conversely, constipation—a loaded rectum—may cause malposition of the uterus and ovarian derangement. A form of rectal constipation which has received little recognition is that which occasions and is the result of the pulling-down of the rectovaginal septum, thereby forming a pouch, changing the direction of the intraabdominal rectal pressure to that of the vaginal, which is at right angles to it, and making it difficult for the rectal sphincters to relax to void the contents of the bowel. Cathartics may be useful when the obstruction is due to inflamed and displaced organs or neoplasms, but would be useless when there has been a displacement of the rectovaginal wall. In such cases glycerin or gluten suppositories or injections of small amounts of olive oil or glycerin may be employed. The daily use of enemas is reprehensible from every point of view. Bougies or dilators may prove beneficial. For constipation of purely rectal origin massage, electricity, and measures designed to improve peristaltic action are of no avail.

The Influence of Diabetes on the Female Genitalia.—Callian³ presents the results of his observations in 58 cases of diabetes. Pruritus vulvæ was the most common condition. Callian emphasized the importance of careful examination of the urine in all women with pelvic troubles, since glycosuria may be present without polyuria. The gravity of the prognosis is directly proportional to the sexual activity of the patient. Atrophy of the uterus and ovaries due to arterial sclerosis is common, and, above all, menstrual disturbances. He has observed marked relief of the diabetes after the removal of fibroids, but he advised operation only if life is threatened by hemorrhage; otherwise the treatment should be confined to a strict antidiabetic diet. Lorand⁴ believes

¹ Feb. 13, 1904.

² *Zent. f. Gynäk.*, 1903, No. 16.

³ *Med. Rec.*, Aug. 6, 1904.

⁴ *La Policlinique*, vol. xii, No. 6.

that diabetes is the pathologic factor in the majority of cases of pruritus vulvæ, and that it is frequently overlooked because the urine is not carefully and repeatedly examined, especially after giving test-meals. Three conditions may favor the development of pruritus in diabetes: the toxic influence of the blood, direct irritation from the urine, and local hyperesthesia of nervous origin. In addition to regulation of the diet he has obtained good results in treatment from the use of an ointment containing 10 % naphthalene and anesthesin.

Acute Thyroidism Following Curetment.—B. H. Wells¹ reports a case of acute toxemia with so-called thyroid symptoms following curetment, occurring in a woman aged 53 years.

Secondary Laparotomy.—H. C. Coe² says that the principal indication for a second operation is pain, either the same of which complaint was made originally, or a new and more severe form. He thinks that intestinal adhesions have been, so far as his experience goes, the most common cause of distressing symptoms, varying in severity from obstinate gastric irritation to intestinal obstruction. Hemorrhages so profuse as actually to sap the vitality of a patient call at times for the removal of the uterus, even when the latter is small and atrophied and the curet shows no evidence of disease of the endometrium. Dysmenorrhea may be marked in connection with cystic or cirrhotic changes following resection of the ovary. Coe is very adverse to resection of the ovaries and tubes in pus cases, though he has operated, leaving ovaries and parts of the ovaries (not the tubes), with gratifying results.

Ultimate Results in Certain Gynecologic Operations.—R. G. Wadsworth³ finds that in 53 cases of laceration of the cervix and perineum there was no relief of symptoms in 26 %. Curetment in 22 cases gave complete symptomatic relief in 45 % and partial relief in 31.8 %, no benefit being perceptible in the remainder. Ventral fixation in 22 cases for retroversion was successful anatomically in 77.3 %, but only 23.5 % received satisfactory symptomatic relief. Of 6 patients on whom Alexander's operation for retroversion was performed, only 16 % were cured, no benefit being perceptible in the others. Of 18 cases of procidentia, 11.1 % were entirely relieved, 33.3 % partially relieved, and no benefit noticed in the remainder. Of 42 cases of hysterectomy for fibroids, 85.7 % showed satisfactory results, and of 5 cases of myomectomy, 80 % showed symptomatic relief. Of 12 cases of uterine cancer in which radical operation was performed, 3 show no signs of recurrence after 4½ years, in 5 cases recurrence and death took place in 3 years, and 4 cases are still in doubt.

The Gynecologic Conditions Following Placenta Prævia.—Erich Radtke⁴ has made a study of 80 patients as to their condition following placenta prævia, and states that of these, 56 retained the power of conception, and 24, or 30 %, were sterile. Of the 80 patients, 23 aborted in the subsequent pregnancy. Seven of these had a previous history of abortion, but the other 16 had not, and as cause of the abortion they

¹ Med. News, June 25, 1904.

² Med. Rec., Mar. 12, 1904.

³ Boston M. and S. Jour., Mar. 24, 1904.

⁴ Zent. f. Gynäk., Nov. 19, 1903.

were found to be suffering from various pathologic conditions, such as endometritis, laceration of cervix, etc. Also 57 of the 80 suffered from subsequent anemia, with weakness, faintness, vertigo, and headache.

Epithelial Spaces in Lymph-nodes.—Falkner¹ found in 13 % of Wertheim's cases of radical operation for cancer of the uterus peculiar spaces within the lymph-glands lined with columnar epithelium. Eighty cadavers were examined (not cases of cancer), and the pelvic glands were studied microscopically without showing any of these spaces; hence the inference that they are not related to the wolffian bodies (as thought by various observers), but to the uterine carcinoma. Observations by Meyer have subsequently shown that these may be due to some other irritation. The inference that these spaces always represent beginning cancerous degeneration is not correct, though in some instances Wertheim demonstrated the presence of epitheliomatous invasion of the spaces.

O. Schaeffer² has for a number of years endeavored to localize **the sensitive regions of the uterus**, and some of his conclusions are as follows: 1. The inner os uteri is, for the sound, the most sensitive part of the cavum uteri, and this sensibility to pain extends toward the median line of the lower edge of the hypogastric region, eventually spreading to the sacral or supraumbilical. 2. Much less, yet distinctly sensitive, is the upper part of the cervical canal, with irritability reaching from the mons veneris and medial inguinal part to the infraumbilical and sacrococcygeal portion. 3. The lower part of the cervical canal is not sensitive, like the wall of the portio vaginalis. The upper sensitive zone seems alone to form Müller's ring. 4. The mucous membrane of the vaginal portio is distinctly sensitive. 5. The posterior vaginal vault is more sensitive, with a zone of pain in the always corresponding reciprocal hypogastrium. 6. The sound, penetrating above the inner os uteri, reaches a completely, or almost completely, nonsensitive part of the lower cavity of the uterus, anatomically, the lower uterine segment. 7. When the ball of the sound rests upon the base of the uterus, in either horn or in the middle, it arrives at a zone of pain which embraces the infraumbilical regions and reaches to the hypochondriolumbar regions. The base of the uterus belongs to another nerve region from the upper cervical canal, and between them lies the described neutral passive portion. This fact is all the more significant, as both these first-mentioned represent 2 distinct but unitedly acting centers of labor pain. The less active part lying between is that known anatomically as the lower uterine segment, and corresponds to the isthmus uteri.

The Unclassified Troubles of Women.—E. C. Savidge³ believes that there are certain important matters connected with the "feminine element" which make for woman's longevity and determine her resistance to many of the inevitables involved by her sex. He refers to a frequently met condition which he calls the "self-obiterated feminine element," occurring either in young girls as the result of overexpenditure of vitality in

¹ Zent. f. Gynak., 1903, No. 50.

² Zent. f. Gynak., May 14, 1904.

³ Med. Rec., May 14, 1904.

intellectual and emotional pursuits and leading to a shortened life when life is most valuable, or in women from 25 to 40 whose increasing lithemia, growing obesity, conscious hebetude, and diminishing menstruation show a strangling-out in function of important selective principles. Savidge believes also that many effective years may be added to the life of a woman after the menopause if we learn to keep patients at this period from becoming uric acid machines, to keep their arteries soft, and to abolish the toxic headache. In these unclassified troubles the psychologic condition aggravates enormously the physical condition. The woman too often feels that she is losing her usefulness to her husband and family and spends her time waiting for the end. These influences all conspire to rob her of what should be the best years of her life and the most useful to the community.

Hysteroneuroses.—D. H. Craig¹ quotes Engelmann's definition as "those phenomena which simulate a morbid condition in an organ which is in an anatomically healthy state and which are due not to structural changes in the organ in which they appear, but to morbid or physiologic changes in the uterus or ovaries." In studying his own recent private records he finds that in 14 % these cases had been misinterpreted by other physicians on account of lack of thorough physical examination. No symptoms should be accepted as a hysteroneurosis until every other cause has been rationally excluded.

Double Vagina with Single Uterus.—F. Marchand² thinks that of all forms of malformation which result from defective union of Müller's ducts the double vagina with single uterus is the rarest. He reports such a case.

Mammary Glands in the Newborn.—H. Raubitschek³ describes a series of preparations from the mammary glands in the newborn. They go to show that the secretion frequently seen at this age ("Hexenmilch") is the result of a necrosis and separation of epithelial cells in the acini and ducts of the glands. The mammary glands at this stage are thus analogous to the sebaceous glands. The secretion of colostrum immediately preceding lactation in the puerperium is of similar origin. The true milk secretion, however, consists of the formation of fat within the cells, without necrotic destruction of the latter.

Pigmentation of Genital Origin.—Dalcé and Fouquet⁴ believe that certain pigment changes in the skin (chloasma, vitiligo, etc.) are of reflex uterine or ovarian origin, possibly due to disturbances in the so-called internal secretions of the ovary. They recognize several varieties, viz.: pigmentation attending menstrual disturbance; that due directly to organic uteroovarian disease; and a third form, which appears in connection with chlorosis, Raynaud's disease, etc., which also may be referred to some pelvic trouble. As regards local treatment, the authors recommend various ointments. The general treatment consists in the relief of amenorrhea and dysmenorrhea or the removal of diseased organs. Ootherapy is also advised.

¹ Boston M. and S. Jour., May 12, 1904.

² Zeit. f. Heilk., Bd. xxv, Heft 1, p. 16.

³ Zeit. f. Gynak., Feb. 13, 1904.

⁴ La Gynécologie, 1903, No. 2.

VULVA, VAGINA, RECTUM, AND BREAST.

Vaccination of the Female Genitals.—Löwenbach¹ has observed 4 cases in which healthy women were infected on the genitals from individuals who had recently been vaccinated. He was able to find only one other case similarly recorded. Infection took place through the medium of clothing, by direct contact, scratching, and in one instance because a physician who had dressed a vaccination sore on a child's arm made a vaginal examination of the mother without washing his hands. In the early stages of such infection the vesicle must be differentiated from pemphigus, eczema, and herpes; in the latter stage, from the syphiloids.

Thomas W. Salmon² reports a case of **diphtheria of the vagina** with secondary involvement of the mouth, rectum, and skin, resulting fatally. The first appearance of the membrane was seen during the course of a gynecologic examination, a week before the presence of the diphtheria bacilli was discovered in the throat. Threads of membrane were noticed in the stools 9 days after the first appearance of the eruption in the vagina. The presence of diphtheria bacilli was shown in the order of appearance by cultures taken from the vagina, the rectum, and the mouth.

Congenital Elephantiasis of the Vulva.—Elephantiasis is regarded usually as a disease of adult life, and it is, therefore, interesting to note a case of its very early development reported by Heil at the recent meeting of the German Gynecological Society.³ The patient, 27 years old, is recorded as a virgin. The tumor arose from the left labium majus and extended to the buttocks. The mother noticed that its formation began with the first three months of the patient's life; it grew very slowly up to the time of the first menstruation, when there was a more rapid growth, followed by a cessation of the increase.

Condyloma Acuminata.—R. R. Smith⁴ reports a case of abundant growth of condyloma acuminata in a female infant aged 19 months. There was no trace of syphilis, but the mother had had gonorrhea 9 months before the child was born.

Cysts of the Clitoris.—Cazin⁵ refers to recent literature on this subject by Peckham and Redinelli. Out of 22 cases of nonmalignant tumors of the clitoris, only 4 were true cysts.

Treatment of Fresh Perineal Tears.—J. Eversmann⁶ believes thoroughly in the immediate repair of perineal tears. Of 132 cases of sutured fresh perineal tears, only 2, or 1.5 %, failed to heal properly. In no case was there much pain, and in only 45 %, a slight rise in temperature.

The Perils of Atresia Vaginæ.—Heidenhain⁷ relates a case illustrative of the bad results which may follow incision of an obstructing septum in order to allow of the escape of retained menstrual blood, even when the immediate performance seems urgent. A girl aged 19 came

¹ Monatsh. f. prak. Dermat., Bd. xxxvi.

² Amer. Med., Mar. 5, 1904.

³ Zent. f. Gynak., July 18, 1904.

⁴ Am. Gyn., Dec., 1903.

⁵ 16me Congress de l'Assoc. franc. de Chir., Paris, Oct. 24, 1903.

⁶ Zent. f. Gynak., Feb. 27, 1904.

⁷ Monatsh. f. Geb. u. Gyn., Mar., 1904, p. 445.

into his consulting room in great pain, walking with her chest bent forward and her hands pressed upon her abdomen. She said she had been told she had an ovarian cyst and begged for immediate removal, because it had become exquisitely painful. Examination showed a tender, smooth, tense but fluctuating swelling extending to several inches above the navel. The hymen was well formed, but immediately above it was detected a tense membrane. This was incised, and over 2½ pints of greasy blood were evacuated. Improvement followed. During the course of a fortnight the temperature—101°—had first sunk to normal, but rose on the fifteenth day concurrently with the occurrence of severe pains in the left iliac fossa. A swelling was noticed in this region and incised, with the evacuation of much greasy blood. The cavity was washed and packed with iodoform gauze. It began to granulate, and the patient did well until 13 days afterward, when her temperature rose and a fluctuating swelling in the right iliac fossa was opened and treated in the same way, containing a large quantity of syrupy blood. Later a bad fecal fistula developed, and 2 or 3 days afterward the patient seemed moribund, chyle coming away in streams. Heidenhain separated the adherent small intestine from the hematosalpinx of the right tube, which had been opened, drew out the tube and resected it, closing the edges in the opening of the dilated tube by suture. The patient was in fair health 9 months later, with the exception of a large hernia which had developed in the scar of the last incision. Commenting upon the case, an editorial in the *British Medical Journal* says a young woman subject to closure of the lower part of the genital canal is obviously in a perilous condition and her life may be in danger at any moment. An incision through the obstructing septum to allow the escape of retained menstrual blood must be made with great caution, and the operator must never press on the abdomen to hasten the flow of the blood. Both practitioner and specialist must remember that grave or even fatal results have followed incision, even when every precaution has been observed. Comment is needless, but this case is a good object-lesson on the perils of atresia. Those who treat a case must be prepared to meet the complications which were encountered by Heidenhain, and to act as promptly if necessary. When there is time for delay, an exploratory operation through the abdomen and removal of the affected parts, if necessary, may be safer than incision of the obstructing membrane in the vagina; while should the uterus and tubes be normal, it might be safer to remove the blood while it is not septic through the upper part of the genital tract than to let it out through a vaginal incision, which involves great risk of infection of residual blood in the dilated tubes and uterine cavity.

Pseudovaginismus.—Kölischer¹ reports 10 cases and assumes that vaginismus is a condition arising from traumatism without subsequent infection. The traumatism may arise from the repeated unsuccessful attempts at coition, leading in time to violent spasm of the constrictor vaginae and the whole perineal musculature at each attempt.

Foreign Bodies in the Vagina.—Orloff² reports a most unusual

¹ *Berl. klin. Woch.*, 1904, No. 14.

² *Roussky Vrach*, 1904, No. 11.

case. A woman of 60 was admitted to his clinic complaining of pains in the lower abdomen and vagina, with the history of a purulent vaginal discharge, dyspnea, and cough. She stated that after the birth of her second child, 30 years before, she was troubled by severe pains in the abdomen and a bearing-down sensation. To obtain relief she introduced a croquet ball into the vagina; this acted as a pessary, bringing immediate relief, and there was no disturbance during the 30 years in the function of either the bladder or the rectum. On examination senile atrophy of the vagina at the introitus was found, the finger touching a round hard body; further up there seemed to be no compression of either the urethra or the rectum. The foreign body could be extracted only piecemeal because of the contracted introitus, but the substance was unchanged, fresh, and compact. Colpitis and occasional ulcers were seen on the vaginal wall.

Fibromyoma of the vagina is considered *in extenso* by Potel.¹ He refers to 160 cases which he found in the literature, and adds 2 cases. In analyzing the statistics, he says that 84 % of the cases occurred in young women. The most common form is the pedunculated variety, and one-half of the number of cases occur in the anterior vaginal wall; their growth is slow, but is much accelerated by pregnancy. The only treatment is extirpation, which may require careful dissection from the rectum and bladder, and, particularly in the case of sessile growths, ligation of the nutrient vessels. Emanuel² adds 4 cases from his own practice. The tumors in his cases were about the size of a walnut and were situated in front of the external ring, 2 being lymphangioectatic fibromas and 2 pure fibromas.

Cysts of the Vagina.—Faulkner³ reports 4 cases of vaginal cysts, among them a cyst of the rectovaginal septum undergoing malignant degeneration.

The Diagnosis of Primary Carcinoma of the Vagina.—An editorial in *American Medicine*,⁴ in an apt discussion of the subject, says: Primary carcinoma of the vagina, as usually seen, will represent a circumscribed neoplasm, and only rarely comes under the observation of the surgeon at the period when it simply forms a cauliflower growth situated in the vaginal walls. When the patient seeks advice for the first time, it is usually with a broken-down ulcer, with a crater-like aspect, with a tendency to involve the underlying structures, and presenting an infiltrated base. In other cases the affection may be met under the form of a diffused neoplasm involving almost the entire vaginal surface, which changes the canal into a rigid, unyielding tube. In both forms the lymph-nodes are secondarily involved at an early date. The symptoms observed in the early stages are the same as those met in carcinoma of the cervix. The disease, which in the beginning is superficially seated, bleeds easily from the slightest touch, especially during coitus, and for this reason this symptom must be considered as one of the most important. Unfortunately, like in carcinoma of the cervix,

¹ Rev. de Gynec., vol. vij, Nos. 2 and 4.

² Berl. klin. Woch., May 9, 1904.

³ Zent. f. Gynäk., 1903, No. 17.

⁴ Apr. 9, 1904.

it appears in many cases at a comparatively late date in the development of the affection. In patients who are cleanly and who observe themselves carefully, a changed condition of the vaginal secretions will be noted. A more or less disagreeable odor will be remarked, which will always draw the patient's attention to her genital organs. Unfortunately for the surgeon, suppuration and ulceration within the vagina are the conditions which lead the patient to seek the advice of her physician, and which indicate that the malignant affection is already advanced. Since the connective tissue of the pelvis is involved rather early in the course of the disease, symptoms of general cachexia are met at a rather early period. Added to these, other phenomena occur which indicate that the neoplasm has involved other organs, such as the rectum, and, in rare cases, the bladder, when the disease starts in the anterior vaginal wall. We then find these unfortunate patients afflicted with a rectovaginal fistula or a vesicovaginal fistula. There are few, if any, difficulties in making a diagnosis of vaginal carcinoma, because by digital examination the finger readily detects the growth by its peculiar uneven surface, with its tendency to break down. Then again a more or less extensive infiltration will be discovered, involving the tissues of the neighboring structures, but it will be necessary to find out whether or not the neoplasm originated primarily in the vagina or has extended from a uterine neoplasm. It is quite important to differentiate a carcinomatous growth of the vagina from a syphilitic or tuberculous lesion. In both of these affections we find a similar breaking-down and extension into the neighboring organs, but the history of the disease and the local examination will usually clear up all doubts as to the true nature of the disease. Primary tuberculosis of the vagina is extremely rare, and usually is present only when tuberculosis of the vulva or uterus is manifest. A microscopic examination should certainly render the diagnosis evident. The prognosis of vaginal carcinoma is the same as in any other malignant affection, namely, very poor, and it is only by an early, radical interference that it can be improved on.

Syphilitic Changes of Vagina and Vaginal Portio.—J. H. Rille¹ thinks the rarity of primary affections of the vagina is conditioned upon the firmness of the epithelial plate cells, the protective coating which the secretions form, and which, perhaps, make ineffective the virus and finally, through the displaceability of the vaginal walls. In the majority of cases the primary syphilitic affection upon the vaginal walls has the appearance of the so-called pregnant sclerosis. A higher grade of induration is rare. The points of induration are usually about the size of flaxseed, though they may have been observed the size of a dime, often covered with red-brown serous fluid or a yellowish-white exudate. Most frequently the primary affection is localized upon the posterior vaginal column, and is usually of brief duration. Secondary syphilitic exanthema of the vagina is rare, also tertiary syphilis, which, when seen, assumes the form of gunmas or knots developed beneath the

¹ Deut. med. Woch., Apr. 21, 1904.

mucosa, or in the form of tumors on the vaginal walls or vaginal fornix, and appears by preference on the posterior commissure and navicular fossa. Primary syphilis of the vaginal portio is not rare. It usually occurs on the anterior cervical lip, sometimes extends into the wide-open cervical canal, and assumes the form of circular or semicircular ulceration. The appearance of typical cases is characteristic, being that of a plainly diseased or damaged substance covered with a brown-red or partly grayish-white, shining surface, from which trickles a serous fluid which mingles with the secretions of uterus and vagina. The soft chancre is easy to differentiate. The variety known as the raised soft ulcer has also been observed. The hard chancre of the vaginal portio may become an obstruction in delivery. The treatment is vaginal irrigation, iodoform tampons, and painting. Secondary and tertiary syphilis of the portio are quite rare, and often the diagnosis can be made only by exclusion.

Vulvovaginitis in Children.—Berkenheim¹ reports the results of observations extending over 10 years, from which he infers that 75 % of the cases of vulvovaginitis in young girls is due to gonorrhea. The relatively mild cases of the inflammation are due to shortness of the vagina in children, the absence of folds and glands, and the slight development of the vessels. Rapid cure is favored by the absence of such disturbing factors as coitus, menstruation, and pregnancy. The average duration of the affection is 8 weeks, but one-third of the cases become chronic. Painful micturition, local hyperemia, and leukorrhea are the common symptoms; complications are rare, especially peritonitis, urethritis, cystitis; arthritis and conjunctivitis are more common. Arthritis generally attacks single joints, and the prognosis is favorable. Berkenheim recommends vaginal injections of solutions of zinc sulfate, boric acid, potassium permanganate, protargol, and ichthyol, although he has never seen a case aborted by these remedies. It is important that the patient should not be allowed to use the same vessel or towels as other children. Bandler² also writes upon this condition with practically the same conclusions. He considers atresia one of the complications of ascending vulvovaginitis.

Rupture of the Vagina and Muscular Pelvic Floor as a Cause for Genital Prolapse.—Schalz³ believes that the perineum is only of very secondary importance as a means of closing the pelvic cavity; that the renal pelvic support is higher up, and, while it remains intact, laceration of the perineum will not cause prolapse.

Rectovaginal Fistula Originating Sub coitu.—The possibility of serious injuries from the first sexual intercourse has been doubted by many authorities, in spite of reports to the contrary. G. B. Sheftel⁴ reports an original case. The woman had a narrow vagina, and the first coitus resulted in a tear through the vagina below the hymen into the rectum. A rectovaginal fistula resulted.

Vaginal Restitution by Transplantation of the Rectum and

¹ Vrach; abstr. in Zent. f. Gynak., 1903, No. 32.

² Med. Rec., 1903.

³ Münch. med. Woch., Nov. 3, 1903.

⁴ Medizinskoe Obozrenie, Ixi, No. 2.

Anus.—In 2 cases Sneguireff,¹ by removing the coccyx, dissecting the rectum from the surrounding structure as far as the bladder, drew down that part of the gut and cut it off; the upper segment was inserted at the point previously occupied by the coccyx between the levator ani; the upper end of the lower segment of the rectum was closed by a continuous suture; the lower segment was then opened anteriorly as far as the blind vaginal sac. The mucous membrane of the sac was sewed to the mucous membrane of the lower segment of the rectum along the incision made anteriorly. Both patients left the hospital able to defecate at will. Coition could be performed in the normal manner.

Treatment of Cancer of the Breast by Operation.—W. Watson Cheyne² states that on the average about 50 % of all patients operated upon for cancer of the breast will remain well for a number of years. Recurrence takes place most frequently internally, and causes less suffering than if operation had not been performed. At its beginning, cancer is a local disease and amenable to surgical treatment. The cancer-cells are the direct progeny of the cells in the original tumor, and epithelial growths cannot originate in lymphatic glands or nonepithelial structures.

Curability of Mammary Carcinoma.—P. Schmidt³ reports the results of 211 cases of mammary carcinoma operated upon by Braun at Göttingen during the last 19 years. Of the patients, 164 were operated upon for primary growths, and of these, 113 having been operated on at least 3 years responded to letters; 32 were cured; in 81 recurrences had occurred. Of the 32, many had been without signs of recurrence for periods varying from 10 to 15 years. In 202 of the 211 patients at least 1 year had elapsed between the onset and operative period of the disease. The average age of the patients was 51 years; the youngest patient was 27 years. Braun always removes the pectoral fascia, and in many cases large portions of the pectoralis major muscle.

Late Recurrence of Mammary Cancer.—Marggraff,⁴ in reporting a case of recurrence 8 years after amputation of the breast for scirrhus, analyzes 860 cases in which the disease reappeared in 430 (50 %). The longest period of immunity was 11 years.

Tumefactions of the Climacteric Breast.—T. A. McGraw⁵ says that for many years he advised immediate operation for all mammary tumefactions of doubtful character in women over 30. He has during later years become convinced that this teaching needs to be materially modified. His experience seems unusually gratifying, as of late the experience of his earlier professional life has been so reversed that where formerly he mourned over lives lost from delay, he is now more often obliged to dissent from the advice of physicians who send cases of benign conditions diagnosed as cancer.

Chronic Mastitis and Diffuse Fibroadenoma of the Breast.—B. Farquhar and Francis C. Wood⁶ state that a chronic induration of

¹ Zent. f. Gynäk., 1904, No. 24.

² Lancet, Mar. 12, 1904.

³ Deut. med. Woch., 1904, No. 15.

⁴ Zent. f. Gynäk., 1904, No. 5.

⁵ Jour. Michigan State Med. Soc., July, 1903.

⁶ Med. News, Aug. 13, 1904.

the breast with a slight enlargement is common in women in the middle period of life, is occasionally seen earlier, but rarely begins after the menopause. These represent two pathologic varieties—the chronic interstitial mastitis and diffuse fibroadenoma. The typical cases are easily distinguishable, but the two conditions may appear in different parts of the same breast, and in some cases it may be impossible to determine whether one or both conditions are present. Both may closely simulate carcinoma in their clinical and physical characteristics, and differentiation from malignant disease may be impossible except after removal. He divides these cases into 3 classes: (1) Marked induration, limited or general; (2) marked induration, limited to one-fourth of the breast or less; (3) marked induration, general. The 2 latter demand surgical treatment.

Paget's Disease.—M. A. Tschlenow,¹ after an exhaustive study, reaches the following convictions: 1. Paget's disease belongs to the group of cancerous skin affections. 2. Clinically the disease presents features peculiar to itself and allowing it to be differentiated from eczema and other similar conditions. 3. Paget's disease is not confined to the female sex; neither is it invariably located on the nipple, other parts being occasionally attacked. 4. Diagnosis in the later stages offers few stumbling-stones. Incipient Paget's disease may, however, be mistaken for eczema, etc. Histologic examination will in such cases give the decision. 5. The origin of the affection is still a matter of conjecture, although a parasitic etiology is probable, as in other forms of cancer. 6. The course is usually chronic, the prognosis in general favorable, especially under proper treatment, which is chiefly surgical.

Angioma of the Breast.—P. Malapert and R. Morichau-Beauchant² report in detail a case of this affection, and present 9 undoubted cases in the literature, 4 additional cases reported being considered as doubtful or as belonging to a different type of tumor. They divide angiomas into cutaneous, subcutaneous, or glandular. Of the 5 cases of the last type, 2 were in males, 2 in females, and 1 the sex not given. The other types are more frequent in males. The tumors exist either from birth or the first few months of life. The diagnosis is ordinarily very easy. The treatment of the cutaneous nevi is that of growths anywhere; that of the subcutaneous angiomas is excision if the breast is not involved. If the gland is involved, the treatment should be that of the glandular type, which is entire removal of the breast; in this way only can recurrence be prevented.

An editorial in *American Medicine*³ discussing **treatment of mammary cysts**, often more or less closely related in time to the menopause, but which may develop at any period after the age of 33, says that this is a serious question to surgeons. The pathology of this condition, which is variously known as cystic involution, cystic degeneration, chronic cystic mastitis, or by one of several other names, is fairly well understood. The cysts are formed by the dilation, usually followed by coalescence, of the acini of some of the gland-lobules. They vary in size from purely

¹ *Chirurgia*, Oct., 1903.² *Rev. de Chir.*, Feb. 10, 1904.³ *Sept. 5, 1903.*

microscopic to those that are 2 or more inches in diameter, and contain a clear, transparent or slightly colored fluid. Accompanying them is a conspicuous increase in the connective tissue of the gland. The differential diagnosis between a solitary, deep-seated cyst, tense with fluid, and a solid tumor is not infrequently a difficult matter, unless, as advised by Robert Abbe,¹ every doubtful tumor is pierced with an aspirating needle. In the case of multiple cysts the diagnosis is comparatively easy. Given the diagnosis of cystic breast, there is a divergence of opinion as to the treatment to be adopted. Broadly speaking, some surgeons look upon the condition as wholly benign, while others believe it to be potentially malignant. Hence the treatment varies from aspiration, incision, and cauterization, excision of the cyst, or aspiration and injection of carbolic acid or iodine, on the one hand, to mammary amputation, on the other. Abbe uses simple aspiration, and reports the cure of 41 cases thus treated during the past 8 years. How many of these cases were seen within the last few years, and hence have been under observation for comparatively a short time, is not stated. Granting, however, that all are of sufficient duration to warrant calling them cured, the histologic findings in a number of reported cases of mammary cysts would seem hardly to justify his statement that the patient can be told she is well when the cyst is aspirated. The findings referred to are the evidence of malignant change in the cysts. J. C. Renton² has reported 2 cases of multiple cysts in both of which cancerous degeneration of one or more of the cysts was found. The axillary lymph-nodes were removed in both of the cases, and the patients have remained well for 3 and 4 years. Renton emphasizes the importance of early operation in any patient over 30 years of age. A single cyst may be removed, and if examination shows it to be malignant, the breast can then be amputated. When multiple cysts exist, he believes that the whole breast ought to be removed. Greenough and Hartwell,³ in a study of 30 specimens, found 3 in which the proliferated epithelium of a number of the cysts had undergone transition into adenocarcinoma. The editorial writer has personally examined a specimen in which a scirrhous carcinoma clearly originated in a cyst. Other instances of malignant transformation could be cited. Which cysts will remain benign and which will become malignant? No one can tell. Considering the very few ultimate cures in cases of mammary cancer, any condition that is known ever to develop into cancer should be looked upon with the greatest distrust. It is no small affair needlessly to amputate a breast, but until a cure for cancer is discovered, earlier operation, in the "precancerous" stage, if possible, is the only hope of lowering the present mortality.

AFFECTIONS OF THE CERVIX AND UTERUS.

Leukoplakia of the Neck of the Uterus.—Verdalle⁴ presented 3 cases, 1 his own and 2 occurring in the practice of M. Labadie-Lagrave.

¹ Med. Rec., Aug. 15, 1903.

² Jour. of Med. Research, June, 1901.
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³ Brit. Med. Jour., April, 1903.

⁴ Gaz. des Hôp., May 26, 1903.

By reason of his investigation of these 3 cases he is convinced of the intimate relation of the condition to syphilis and epithelioma in analogy with buccal or lingual leukoplakia.

Laceration of the Cervix Uteri.—J. M. Baldy¹ (Philadelphia) stated that, as a matter of clinical fact, let the cervix uteri be torn deeply, and if the parts were preserved from infection, the greater part of the wound would heal spontaneously, and the remainder of it would remain perfectly healthy. The lips would remain uninfiltated, of normal size and thickness, with no eversion and no erosion of the lining mucous membrane. In such a case there would be no untoward symptoms and no bad effects whatever. There was a tendency among obstetricians to repair these lacerations primarily. The objections to such practice were manifold, and these he pointed out. Whatever might be ideal surgery under the exigencies of actual practice, the treatment for recent lacerations of the cervix remained, and he believed would remain, namely, rigid local cleanliness, excepting where there was sufficient hemorrhage to demand a ligature. There was one belief prevalent which would warrant, nay, demand, a repair of every lacerated cervix—the belief that lacerations of the cervix produced carcinoma. In this belief he took no part, and no one had, to his knowledge, as yet brought forward a scientific fact which would uphold such a theory. In 20 years' work he had not seen a single case of cancer develop in a laceration of the cervix which he had refused to repair.

Lacerations of the Cervix and Their Consequences.—J. W. Taylor² (Birmingham) says that in most of the septic cases to which he has been summoned he finds serious laceration of the cervix, of the vagina, and of the peritoneum as the wounds from which the septic and generally fatal process has started. The greater number of minor lacerations of the cervix heal without consequences; but those of a major degree may cause sepsis, subinvolution, serious menorrhagia, uterine descent and flexion, cervicitis, abortion, sterility, atrophy of the uterine wall at the highest limit of the tear, and finally epithelioma. The troubles due to uterine lesion only can all be completely cured by repair of the laceration, combined with a preliminary curetment.

Malignant Degeneration of the Cervical Stump After Subtotal Hysterectomy.—L. G. Richelot³ considers that all that can be said in favor of supravaginal hysterectomy can also be said of total hysterectomy. There are cases certainly in which the subtotal hysterectomy is preferable, but as regards technic and immediate results, there is nothing to choose between the 2 methods. The stump which is left behind, may, however, become the seat of malignant degeneration, carcinoma, or sarcoma. In his opinion the fibromatous uterus is not simply soil on which malignant tumors may grow: it is the soil on which they do grow.

The Topography of Cervical Fibroids.—Bland Sutton⁴ makes cervical fibroids the subject of a paper in which he gives the frequency

¹ Amer. Med., Aug. 20, 1904.

² Brit. Gyn. Jour., Nov. 3, 1903; abstr. in Amer. Med., Feb. 20, 1904.

³ La Gyn., Oct., 1903.

⁴ Lancet, Apr. 2, 1904.

as 5 % of uterine fibromas. Fibroids may grow from any part of the cervix; commonly they arise from its walls in such a way as to occupy

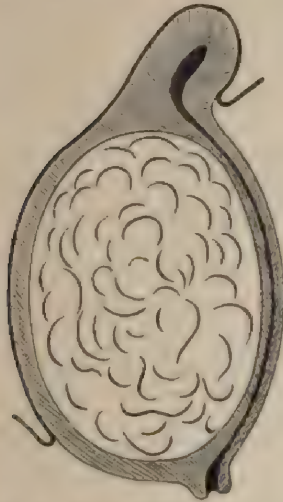


Fig. 40.—Diagram to show the relation of an intracervical fibroid to the cervical canal (Sutton, in *Lancet*, Apr. 2, 1904).



Fig. 41.—Diagram of a fibroid growing from the posterior wall of the cervix, showing its relation to the peritoneum (Sutton, in *Lancet*, Apr. 2, 1904).

the cervical canal (Fig. 40). Less frequently they grow from the periphery of the cervix and do not invade the canal, but burrow under the peritoneum on the anterior or the posterior aspect of the uterus (Figs. 41 and 42). Fibroids on the anterior aspect of the neck of the uterus remain more or less globular and do not distort the shape of the cervix, as a rule; when of large dimensions, they push their way upward between the peritoneum and the anterior abdominal wall. It is a noteworthy feature of the cervical fibroid that in more than two-thirds of the cases the tumor is solitary. Fibroids of the neck of the uterus when they do not cause menorrhagia are very insidious and rarely give rise to serious symptoms until large enough to fill the pelvis and to exert pressure on the urethra, the vesical segments of the ureters, and the rectum. In some cases, especially variety C (Fig. 42), there is direct pressure on the bladder. A study of Sutton's cases brings out very well the following points: (1) Menor-

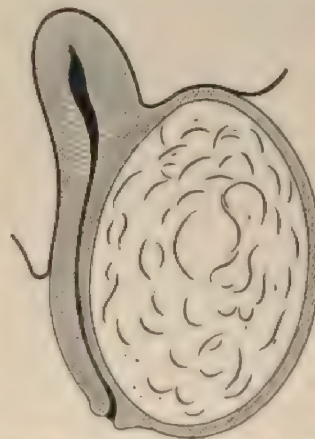


Fig. 42.—Diagram of a fibroid growing from the anterior wall of the cervix, to show its relation to the peritoneum as it passes from the anterior wall of the uterus to the bladder (Sutton, in *Lancet*, Apr. 2, 1904).

rhagia and metrorrhagia are noticed only with the intracervical variety and bear no relation to the size of the tumor; and (2) hemorrhages (menorrhagia and metrorrhagia) occur only with intracervical fibroids when the uterus has made attempts to extrude, or has succeeded in extruding, the tumor wholly or partially into the vagina. The corollary is plain. An external or partially extruded fibroid is exceedingly liable to become septic, and as surely as this happens, menorrhagia and metrorrhagia are unfailing consequences.

Operation for Myoma of the Cervix.—Gottschalk¹ describes an operation for the removal of myoma of the cervix by the vagina, which he claims offers several advantages over other methods. On examination a large interstitial submucous myoma of the cervix was found to fill the whole pelvis. The anterior cervical lip was represented by a very small ridge, which it was just possible to seize with forceps, but not to draw down. The vagina was, therefore, incised *in situ*, and the neck of the uterus was divided from the bladder and broad ligament. Next, the posterior wall of the vagina was separated from the rectum, and Douglas's pouch was pushed upward but not opened. In the posterior portion of the tumor, which was thus exposed, an incision of about 2 inches in length was made to the right and behind the external os in an oblique sagittal direction, through the neck of the uterus. In order to protect Douglas's pouch from being damaged, the posterior edge of the wound was provisionally sutured to the posterior edge of the vaginal wound. The tumor was then shelled out of the surrounding wall as far as possible by the finger, and a wedge-shaped piece cut out and removed. The remainder of the tumor was then removed piecemeal, until the last segment, which was about the size of a fetal head, was removed, when considerable hemorrhage took place from the cavity of the uterus. Intrauterine packing with iodoform gauze soon arrested this. The sac in which the tumor had been situated, after the latter had been removed, lay inverted, hanging out of the wound in the neck of the uterus. This was pulled as far as possible out of the wound, and ligated above a clamp close to the uterus. It was then cut off between the clip and the ligature, and after Gottschalk had satisfied himself by digital examination that the mucous lining of the cervix was in good apposition and quite smooth, the vaginal vault was again closed, care being taken that the wound in the cervix was well covered. Packing behind the uterus acted as a counterpressure to the intrauterine packing.

Tuberculosis of the Portio Vaginalis and of the Uterus.—Vineberg² reports a case and states that tuberculosis of the cervix may manifest itself in 4 different forms: (1) A cauliflower-like growth showing some tendency to bleed upon being touched (it is this form which has most frequently been mistaken for carcinoma). (2) An ulcerative form with sharp undermined edges. (3) The vaginal portio is studded with miliary tubercles, and the cervical mucosa may also be so, and from here the tubercles may penetrate the whole thickness of the cervical wall. (4) The tuberculous process is localized to the superficial epi-

¹ Deut. med. Woch., Oct. 2, 1903.

² Am. Gyn., Oct., 1903.

thelium of the glands, the latter being filled with masses containing numerous tubercle bacilli, constituting the bacillary catarrh of Schmidt.

Endothelioma of the Cervix.—The ninth case of this affection is reported by Kirchgesner.¹ His patient came to him because of a bloody discharge that had existed for a year and a half. She was young, but had had several children. On examination a fluctuating irregular growth the size of a pigeon's egg was seen on the anterior lip of the cervix; the posterior lip was normal, and the uterus and adnexa were not adherent. The uterus was removed, but the patient died of peritonitis 4 days later. Microscopic examination of the newgrowth showed that it had developed from the endothelioma of the lymphatics and the lymph-spaces of the portio.

Vaginal Hysterectomy for Cancer of the Cervix During Pregnancy.—R. and A. Condamin² claim that surgical intervention is called for in cases of operable cancer of the cervix discovered during pregnancy.

Palliative Treatment of Cervical Carcinoma.—Chase³ states that in the relief of cervical cancer the value of the thermocautery, either the galvanocautery or Paquelin, has superior advantages. Applied with skill, it is usually bloodless. The cautery effectually closes the absorbent vessels and limits infection. In addition to this the influence of heat on cancer-cells, beyond the area of the actual destruction of tissue, is most satisfactory. The healing is often prompt, and the diseased growth is arrested, and in some instances permanently so. Coincident therewith the pain and offensive discharge are mitigated or arrested. Reports of cases coming under palliative treatment 2½ years ago show no return of the disease and to present appearances are cured. The thermocautery treatment of cancer of the cervix is not advocated as a substitute for radical operative interference, but as a palliative method for those cases in which radical measures are not indicated from the advance of the disease and in cases where the patient refuses operation. One peculiarity of the results following the thermocautery operations is that if there is no burning of the mucocutaneous surfaces, the pain is almost entirely absent. So also cases which have had these operations have been greatly relieved and often entirely relieved of the preëxisting pain by the operation.

The Pelvic Ureteral Sheath and its Relation to the Extension of Carcinoma Cervicis Uteri.—John A. Sampson⁴ states that the pelvic portion of the ureter is surrounded by a sheath which is apparently derived from the tissues which surround the ureter. This sheath is of a definite anatomic structure, and is of great importance to the ureter, since it forms a channel in which the ureter may slide as it contracts, and protects the ureter, together with its bloodvessels, from the invasion of newgrowths or of inflammatory processes. On the other hand, the involvement of the sheath by a neoplasm or an inflammatory process compresses the ureter, causing hydroureter, and predisposing the kidney to infection.

¹ Zeit. f. Geb. u. Gyn., Bd. xlix, Heft 52.

² Lyon méd., Aug. 7, 1904.

³ Brooklyn Med. Jour., Jan. 12, 1903. ⁴ Jour. Am. Med. Assoc., Sept. 10, 1904.

The Results of the Fight Against Cancer of the Uterus in East Prussia.—G. Winter¹ says that not more radical methods, but solely early diagnosis, can promise to improve the lasting results of the operative treatment for uterine cancer. In a most interesting monograph² he dwelt upon the various obstacles commonly met in the early diagnosis of and early operation upon the cases, and submitted much valuable advice as how to overcome these obstacles. Backed by his official position as professor of the University, Königsburg, Winter has endeavored to transfer into practice his theoretic suggestions, and in East Prussia, in a most methodic way, has waged a war against uterine cancer. He secured the help of the physicians by applying to the district physicians; he appealed to the trained midwives and to the public at large by specially written articles which were widely distributed by means of the daily newspapers. This systematic agitation began December, 1902, and just one year afterward Winter began to estimate the results of this propaganda. The article in the *Zentralblatt* gives a tabulated survey of these results, and certainly removes every possible doubt regarding the feasibility of Winter's suggestions. (1) Effect upon physicians: Winter insists upon a careful vaginal examination of all doubtful or suspicious cases. While the clinical records of the carcinoma patients observed from 1898 to 1902 show that 14 % of the physicians who had attended these cases had failed to make any internal examination, of the 45 cases in 1903 who had consulted physicians previous to their admission to the hospital, only 5 (11 %) had not been examined at the time of their first consultation. But even in these 5 cases acceptable explanations could be found for this omission. (2) The second desideratum of Winter is the early recognition of carcinoma by means of microscopic examination. The appeal resulted in 43 specimens of curetings being sent to the university for investigation, in several of which carcinoma was detected. In only 2 cases physicians must be blamed for negligence in this respect, one treating a beginning cervix carcinoma for 5 weeks as an erosion. Midwives are urged by Winter to send every patient with suspicious symptoms immediately to a physician. Out of the 84 cancer patients observed in 1903, 8 had first consulted midwives; 3 cases were, immediately after the first examination, 3 other cases without any examination, referred to a physician; in one case only a midwife continued to treat a patient without an internal examination. The comparison with conditions in preceding years is striking. While the percentage of negligent midwives previously had been 54, it sank suddenly to 14 % in 1903. (3) As to the effect upon the public in general—naturally, indolence on the part of the patients, ignorance concerning the symptoms, false modesty, fear and lack of either time or money, are among the main causes for dangerous delay in establishing the diagnosis and instituting proper treatment. Winter accepted the time which had elapsed between the appearance of the first symptoms and the first consultation of a physician, on the one hand, and the time be-

¹ *Zent. f. Gynäk.*, 1904, No. 14.

² *The Fight Against Uterine Carcinoma*, F. Enke, Stuttgart, 1904.

tween the consultation and the operation, on the other hand, as fairly indicating the effect of his endeavors to propagate a better understanding of the first symptoms and the dangers of uterine cancer. Physicians were consulted after the appearance of symptoms: Within the first month in 1903, by 22 %; in preceding years, by 14 % of all patients; after the first month in 1903, by 35 %; in preceding years, by 18 %; after 3 months in 1903, by 33 %; in preceding years, by 26 %; after 6 months in 1903, by 5 %; in preceding years, by 12 %; after 9 months in 1903, by 5 %; in preceding years, by 18 %; after 12 months in 1903, by 0; in preceding years, by 12 %. The time which had elapsed between first consultation and operation was up to 8 days in 1903, 78 %; in preceding years, 63 %; up to 2 weeks in 1903, 12 %; in preceding years, 15 %, etc.; up to 3 months in 1903, 0; in preceding years, 5 %. The eminent practical value of this propaganda among the laity is proved by two facts: In 1903, 57 % of the cancer patients have consulted a physician within the first 3 months; in preceding years, only 32 %. In 1903, 90 % have been operated upon within 2 weeks after the first consultation; in preceding years, only 78 %. (4) Operability of carcinoma: The sum-total of the effect of Winter's fight must naturally become apparent in an increase in the percentage of those cases that are still operable at the time when the diagnosis of carcinoma is made. The operability increased in the clinic from 71 % in 1902 to 82 % in 1903; in the hands of all specialists operating in East Prussia, from 52 % in 1902 to 65 % in 1903, so that it can be said that within one year the operability has risen in East Prussia from 62 % to 74 %.

An editorial in *American Medicine*¹ says that the hemorrhage in **carcinoma uteri** sometimes amounts simply to an ordinary metrorrhagia; the amount of blood lost is increased, and the duration of the menses is longer than usual. At other times the patient suffers from intermenstrual losses of blood which lead her to suppose that the menses occur several times a month. The amount of blood lost is not in large enough quantity to be termed a hemorrhage, and intrauterine and vaginal packing may diminish the intensity of the flux without causing it entirely to disappear. In some cases, however, it may be necessary to operate. Olshausen recommends hysterectomy in cases of uterine hemorrhages which continue in spite of all the usual measures employed to control them, when they are sufficient to endanger the patient's life. The necessity for operating for the hemorrhage rarely occurs, but the early appearance, frequent repetition, and increased amount of the blood impart a rapid progress to the affection. Beside these hemorrhages, which merely belong to the nearly constant symptomatic *ensemble* of carcinoma of the cervix, one should recollect that these patients are always exposed to accidental hemorrhage of serious proportions. In cases of the cauliflower variety of neoplasm, in which the phenomena of necrobiosis reach the highest intensity, a fatigue, a long walk, or a rough examination is sufficient to lacerate the tissues and open the bloodvessels. A large artery may thus be opened, the hemorrhage being really alarming, but

¹ Mar. 26, 1904.

usually the bleeding will amount to a free oozing from the veins. The occurrence and gravity of the hemorrhages are consequently an indication for hysterectomy, which has not only an immediate curative action, but also a far-reaching one as well, because the recurrence of the neoplasm arises usually behind the vaginal cicatrix, and ulcerates through the vagina only toward the end of the malady. On the other hand, in those cases where the neoplasm recurs in the cicatrix, the hemorrhage will not have its former severity. Hemorrhage is an indication for hysterectomy, which should be undertaken in all cases in which no unfavorable conditions are present which would oblige one to resort to a palliative treatment. Now, when should one interfere? Sometimes the anemia is so marked, the pulse so weak, that the slightest loss of blood would not be withstood, so one must temporize, and by proper treatment directed to the control of the hemorrhage endeavor to strengthen the patient until she has sufficiently recovered to enable her to stand the shock of an operation. To control temporarily the bleeding, curetment and cauterization of the neoplasm are by far the surest ways, and then rest in bed for several weeks, with liberal feeding, will place the patient in a condition suitable for the radical operation. Temporizing is certainly prudent, but has the serious inconvenience of necessitating a relatively long period of time, during which the neoplasm progresses with all the greater rapidity because the patient is in a weakened condition. For this reason one should be encouraged to interfere at an early date, because at present we are better armed against the loss of blood by the use of saline injections and other methods too well known to require mention here. According to our way of thinking, one should take into consideration two eventualities, namely: either the neoplasm is at its début, so that hysterectomy will be easy and rapid, and only a trivial amount of blood lost, in which case the operation is urgently indicated; the shortness of the operation greatly diminishes the danger of the anesthesia, and if done by the vaginal route, can be accomplished in several minutes. In other cases, on the contrary, the uterus is bound down, and the operation will be long and probably difficult. Under these circumstances a procedure palliative in character should be adopted, but which will, nevertheless, have a most effective action on one of the most menacing symptoms. Later the uterus and adnexa may be removed if not too late.

Carcinoma and Tuberculosis in the Same Uterus.—J. Wallert¹ adds 3 cases of associated carcinoma and tuberculosis of the genitals to the small list recorded thus far.

Myoperithelioma.—Gottschalk² reports the following case, which he regards as unique: The patient, aged 51, had multiple uterine nodules, which grew rapidly and were accompanied by a constant bloody discharge. The diagnosis of fibroids with malignant degeneration was made, and the uterus was removed successfully. Numerous fibroid nodules were found, especially sessile submucous. The latter were covered with papillary excrescences, as well as the surrounding endometrium. Microscopic examination showed that the growths had developed

¹ Zeit. f. Geb. u. Gyn., 1904, 1, 243.

² Zent. f. Gynäk., 1903, No. 42.

from the perithelia of the adventitia and from the deeper, rather than from the superficial, vessels. In the sections of the myomas the ordinary alveolar structure of cancer was found, while in the superficial portion the pure perithelial type prevailed. The conclusion drawn by Gottschalk was that the malignant change began in those vessels of the myoma just beneath the mucosa.

Chorioepithelioma.—S. von Zahorsky¹ reports the case of a woman, aged 47, who had had 8 normal deliveries, and in March, 1901, a severe hemorrhage, which was undoubtedly an abortion. In April she came to the clinic, and a vaginal examination led to a diagnosis of a cyst. Later, rise in temperature and chills indicated serious complications. The abdomen was opened and the tumor found to be a malignant chorioepithelioma with metastatic growths in vagina and both lungs. Death occurred half an hour after operation. The great malignity of this neoplasm is shown by its fatal termination after only 3 months' growth.

Uterine Cancer.—F. H. Maier² says the statistics of the representative gynecologic clinics show that the mortality from carcinoma of the uterus has undergone, and is still undergoing, a relative reduction. This reduction is chiefly the result of the increasing number of cases that are brought to timely operation, and is influenced largely by 2 highly important factors: (a) The physician; (b) the patient. 1. The earlier a positive diagnosis is made, the better the opportunity for timely operative intervention. The presence or absence of any one of the classic subjective symptoms pointing to carcinoma of the uterus should be utterly disregarded, and the diagnosis based upon objective examinations only. The patient should be impressed with the risk she runs, wherever there is suspicion of malignant disease, in failing to submit to the necessary pelvic examination, as well as with the grave nature of some cases of rapidly advancing carcinoma, which occur in the absence of symptoms indicative to the patient of such a condition. The popular fallacies that "pain" is the most significant symptom, and that postmenstrual hemorrhage is always physiologic, especially when associated with the menopause, must be dispelled. 2. In the present state of our knowledge of the predisposing and contributing causes of carcinoma of the uterus we can conservatively accept, in the absence of a more tangible explanation, the view that trauma is often responsible for at least the propagation if not the cause of the disease. 3. The fact that women suffering from the so-called condition of "cancerophobia" are comparatively free from the disease should be regarded not altogether in the light of a coincidence, but rather the relation between this immunity and the constant medical surveillance which the patient is under, should be considered. 4. In so far as the healthy uterus is less liable to undergo progressive malignant changes, a highly important element in prophylaxis should be to keep the uterine mucosa in as normal a condition as possible, and under no circumstances to neglect lacerations, inflammation, and erosions, especially during the menopause.

¹ *Zent. f. Gynak.*, May 7, 1904.

² *N. Y. Med. Jour.*, Apr. 30, 1904.

Abdominal versus Vaginal Hysterectomy.—J. B. Deaver¹ discusses the methods of hysterectomy, with special reference to operation, as a remedy for cancer of the uterus. If the uterus is adherent and fixed in the pelvis, the broad ligaments extensively infiltrated, and the vaginal vault involved, operation is inadvisable. When operation is advisable, he opposes vaginal hysterectomy for cancer of the cervix except in the presence of obstacles necessitating such a course. He does not think any necessity exists to dissect out the iliac glands, as the additional mortality from operation is not repaid by lessened recurrence.

Shauta² strongly advocates the vaginal route in hysterectomy for carcinoma. His opinion is based upon a study of the lymph-glands in 60 women dead of carcinoma. He divides the lymph-glands into two groups—those which may be extirpated by operation and those which may not be reached. In 13.3 % the first group were affected and the second group not malignant in character. In all the other cases either both groups were infected or both were free. It is not necessarily the large nodular infiltrated gland which is the seat of malignant change, but rather the small and apparently normal ones are thus affected. The carcinoma cells may also be found in the connective tissue and in the veins lying between the glands. Since all these glands cannot be removed even by the most radical abdominal operation, the additional danger of such an operation is unnecessary. It is noted that when the primary malignant focus is removed, the glands may for a long time remain latent or may become necrotic and the malignant tissue be destroyed. Olhausen³ prefers the vaginal route until proof from statistics extending over 5 years is advanced that the abdominal method is better.

Total Abdominal Extirpation of the Uterus.—Krönig⁴ is of opinion that necrosis of the ureter, postoperative cystitis, and phlegmon of the connective tissue are likely to follow Wertheim's radical operation for uterine cancer. In order to avoid these dangers he does not separate the uterus from the adjacent peritoneum, but leaves a broad strip of attachment.

Results of Vaginal Hysterectomy in Uterine Cancer.—Flaischle⁵ reports a series of 48 cases of removal of the womb through vagina for cancer: there were 4 deaths from operation; recurrence in 24 instances; 17 living after an interval of 8 years; 12 free from recurrence for 10 years; 9 well after 13 years. He contrasts these results with those of Pozzi, who says that he could report only 2 permanent cures out of 204 cases. He attributes these results, however, to the fact that early diagnosis was made in every case, thus supporting Winter's statement that success depends more upon early recognition of the disease than upon the nature of the operation. Flaischle is of opinion that his statistics prove that abdominal hysterectomy will not supplant the vaginal method.

Development of Cancer from Mucous Polyps.—Opitz⁶ reports 2 cases, the first of which presented unusual features.

¹ Med. News, Feb. 6, 1904.

² Zeit. f. Geb. u. Gyn., Bd. i, Heft 1.

³ Zeit. f. Gynäk., 1903, No. 52.

⁴ Monats. f. Geb. u. Gyn., Bd. xix, Heft 4.

⁵ Monats. f. Geb. u. Gyn., Feb. 19, 1904.

⁶ Zeit. f. Geb. u. Gyn., Bd. xlix, Heft 2.

Uterine Adenomyoma.—Cameron and Leitch¹ discuss the histologic and clinical aspects of these tumors, report the case study in detail in several instances, and give the following conclusions as to the stages of these tumor-formations: 1. An ingrowth of the structures of the endometrium into the muscular wall, as is seen in hypertrophic endometritis—the stage of glandular inclusion. 2. A hyperplasia of the inclusions and a progressive infiltration simulating muscular hyperplasia—a stage of benign adenomyoma. 3. A loss of relation between glandular and muscular elements, the growth of the former outstripping that of the latter, inversion and eversion of the epithelium, with a consequent displacement of the glandular stroma and an encroachment upon the muscle, the irritation of the growth causing round-celled infiltration—the stage of malignant adenoma. 4. The stage of adenocarcinoma—the loss of relation between one epithelial cell and another, the riotous proliferation and heaping-up of immature epithelial cells which break through the restraining basement membrane.

The Value of Histologic Examination in Carcinoma of the Uterus.—Brooke M. Anspach² analyzes the advantages of histologic examination not only as confirmative in clinical diagnosis, but because of the opportunity afforded for early operation and consequent increase of opportunity for recovery. In many cases, without the assurance given by the microscope, the necessity for operation would be at least uncertain. Carcinoma often becomes hopelessly incurable while the effect of a palliative treatment is being observed in the effort to establish diagnosis. A physician should employ the microscope in all cases of metrorrhagia in which the diagnosis is not entirely plain. After every amputation of the cervical lips the incised tissue should be routinely examined to detect whether a malignant has been mistaken for a benign process. In cases in which there is a strong suspicion of carcinoma, a positive diagnosis may be made while the patient is under ether, so that if a malignant growth is found, hysterectomy may immediately be undertaken.

The Lymph-nodes in Cancer of the Uterus.—Oehlecker³ had an opportunity to study the condition of the lymphatic glands in the bodies of 7 patients who succumbed to vaginal hysterectomy for cancer of the uterus. Metastases were found in 2 of the cases, and these were appreciable only microscopically. In no instance did a gland show such macroscopic changes as to lead to the inference that it was the seat of cancerous degeneration. In the 5 negative cases a few glands were enlarged, but only from inflammatory hyperplasia. Oehlecker admits that foci might have existed in the intermediate lymphatics which were not detected. The practical inference, according to Oehlecker, is that mere hypertrophy of a lymph-node does not warrant the inference that metastasis has occurred in it, and that consequently radical operation is indicated.

Inoperable Cancer of the Uterus. Blau⁴ analyzes 408 cases of inoperable cancer in Chrobak's clinic, with particular reference to the result.

¹ Lancet, July 9, 1904.

² Zeit. f. Geb. u. Gyn., Bd. xlviii, Heft 2.

³ Amer. Med. Soc., Feb. 13, 1904.

⁴ Zeit. f. Gyn., 1903, No. 45.

of palliative treatment. As much of the diseased tissue as possible was, in these cases, removed with a sharp spoon, and the new surface was cauterized with fuming nitric acid with Paquelin cautery, the cavity then being tamponed with iodoform gauze, which was removed on the fourth day. Applications of tincture of iodine were made every 2 or 3 days in order to permit granulation and scar tissue. At intervals of 3 or 4 months the surface was touched with nitric acid, or a 20 % alcoholic solution of bromine. For the foul discharge iodoform was used freely with injections of potassium permanganate or creolin. The series gave only 2 deaths, and 342 patients were kept under observation.

G. Kosler¹ reports several cases of inoperable carcinoma treated by ligation of the hypogastric arteries, but as the hemorrhages returned in a brief period, except in rare instances, he prefers excochleation and cauterization as less difficult and dangerous and about as effective. It is only in rare instances that the double ligatures may be used to advantage to preserve for a time the life threatened by severe hemorrhage. R. S. Gamboa,² in an incomplete report, suggests the value of cutting down on the lesion and ligating the branches of arterial supply. Many cases so treated show improvement, and the wretched discharge is greatly lessened. One death occurred among 37 patients.

Combined Use of the Finsen Light and Röntgen Ray in the Treatment of Uterine Carcinoma.—G. G. Hopkins³ believes that in the combined use of the Finsen light and röntgen ray, the principal dependence being the Finsen light, he has devised a very satisfactory method for the cure of uterine carcinoma, especially when the disease originates in the cervix. Great caution must be observed in the use of the röntgen ray, particularly in recurrent cases in which hysterectomy has been done. He has found that an hour's exposure to the Finsen light and 5 to 8 minutes' exposure to the röntgen ray is a good proportion in which to employ the two agents.

Uterine Sarcoma in a Child.—Bluhm⁴ reports an interesting case of sarcoma of the cervix in a girl of 11 years, who presented as a sole symptom of the condition an occasional slight bloody discharge from the vagina. Bluhm states that while there are serious objections to making vaginal examinations in children, the persistence of bleeding from the genitals without a history of trauma should at once awaken suspicions of the presence of sarcoma and lead to a careful investigation. Narcosis and, if necessary, incision of the vagina are justifiable. Every cervical polyp in a child should be examined microscopically, since the importance of an early radical operation in sarcoma is self-evident.

Sarcomatous Degeneration of Uterine Myoma in Youth.—Odebrecht⁵ relates the case of a virgin with a uterine tumor. On microscopic examination the newgrowth proved to be undoubtedly a sarcoma: the uterus was therefore removed. The sarcoma had developed into a

¹ Zent. f. Gynäk., Apr. 16, 1904.

² Crónica Médica Mexicana, Mar. 1, 1904.

³ Brooklyn Med. Jour., Dec., 1903.

⁴ Arch. f. Gyn., Bd. lxxviii, Heft 62.

⁵ Zent. f. Gynäk., 1904, No. 2.

fibromyoma. Gessner collected 131 cases of sarcoma of the uterine wall, and in only 1 of this series was the patient a young woman.

Sarcomatous Transformation of Uterine Fibroids.—An editorial in *American Medicine*¹ says that one of the most cogent arguments which has been advanced for early operation in fibroid uterine tumors is the possibility of malignant degeneration. The fact that these tumors might undergo necrobiosis if the nutrition was suddenly cut off has long been recognized; and the contiguity of the intestines in subperitoneal growths and the exposure of submucous tumors to infection usually determine a necrosis, if the blood-supply of such tumor is cut off. To say that a myoma may undergo carcinomatous degeneration involves a contradiction of terms, as the epithelial elements requisite for such degeneration are not present. But although the two growths are frequently associated, according to Cullen it is only in very rare instances that the myoma is found to be invaded by the epithelial growth. Hirst believes that the carcinomatous degeneration is explained either by the extension of adenocarcinoma from the endometrium into the tumor, or by carcinoma of the epithelium into an adenomyoma. Sanger asserts that all myomatous growths containing irritation cells (*myoklasen*) are sarcomatous, and Martin found sarcomatous degeneration 6 times in 205 cases of fibroids, while Cullen and Clark believe that, taking all myomatous cases, we have at least 2 % in which a malignant growth of some character is present. The clinical history of sarcomatous degeneration is rather significant. A myomatous uterus which has lain comparatively dormant for several years suddenly becomes enlarged. If the myoma has been submucous, portions may be expelled and there is often a free, offensive discharge. The operative significance of this laboratory investigation is what is important to the patient and to the surgeon, and has been admirably summarized by Cullen as follows: 1. Whenever sarcoma or carcinoma may coexist with myoma, panhysterectomy is imperative—not amputation through the cervix. 2. Bisection of the uterus is contraindicated where there is a possibility of a malignant growth developing in or associated with the myomatous uterus. 3. In every case of hysteromyomectomy it will be advisable to have an assistant open the uterus immediately on its removal, to determine if carcinoma of the body exists and to find out whether the myoma has become sarcomatous. If malignancy is detected, the cervix can thus be removed without delay.

Sarcomatous Degeneration of Uterine Fibroids.—An interesting discussion on this subject was recently opened by Evelt.² He detected sarcomatous degeneration in 3 out of 120 cases of fibroids operated upon. Evelt speaks particularly of the rarity of the condition, particularly of primary melanocarcinoma, observed in 1 of the cases, and in the difficulty of clinical diagnosis.

Perils of Fibroids after the Menopause.—Pearl-Barrett³ says it is essential to bear in mind that the presence of a fibroid in the uterus

¹ Nov. 7, 1902.

² *Monat. f. Gyn. u. Gyn. Soc.*, 1903.

³ *Lancet*, June 5, 1903.

in a large proportion of women has a very malicious influence in delaying the menopause; and it is an important question whether the irregular and long-maintained vaginal fluxes of blood in a woman with uterine fibroids, after the fiftieth year, should be regarded as menstruation in the proper acceptance of the term.

Hemorrhage of Fibroids.—Theilhaber and Hollinger¹ found, in their studies of 19 uteruses extirpated for fibroid, disease of the endometrium was present as often in the nonhemorrhagic case as in those associated with hemorrhage.

Recurrent Fibroids of the Uterus.—V. S. Grousdeff² says the radical operation would seem indicated in all cases of so-called recurrent fibroids. He reports a case in point in detail.

Complications of Uterine Fibroids.—Watt-Keen³ notes the following complications occurring in 417 cases of uterine fibroid from Hofmeier's clinic: ovarian cyst, 27; diseased tubes, 19; hernia, 7; uterine displacements, 14; carcinoma and sarcoma of the body of the uterus, 9; myxomatous degeneration, 8; necrosis, 8. Sterility was noticed in 20 % of the married women, abdominal myomectomy was performed 123 times, supravaginal amputation 44 times, total extirpation 15 times, vaginal myomectomy 45 times, total hysterectomy 43 times. The total mortality was 6.48 %.

Complications and Degenerations of Uterine Fibromyomas.—E. M'Donald⁴ believes all fibroids producing symptoms and all except those designated as small (especially when subserous or intramural) should be removed, because risk from operation is less than that of the tumors themselves from sarcomatous changes, carcinomatous associations, and complications.

The Nature of the Indications for Operation for Fibroid Tumors of the Uterus.—Charles P. Noble⁵ presented a table of the degenerations and complications in a series of 1188 cases of fibroid tumors operated upon by Martin, Noble, Cullingworth, Frederick, Scharlieb, and in a series reported by Hunner and MacDonald. Especial attention was called to the relative frequency of adenocarcinoma of the uterus as compared with epithelioma of the cervix. The deduction drawn from this fact was that fibroid tumors were a direct predisposing cause of cancer of the cervix. A careful consideration of the facts presented, said Noble, should convince any one with an open mind that the classic teachings concerning fibroid tumors were erroneous. This teaching was that fibroid tumors of the uterus were benign growths, which usually produced but few symptoms, and which, after the menopause, underwent retrogressive changes, becoming smaller or disappearing; and that the chief danger of fibroid tumors consisted in the fact that at times they caused hemorrhages from the uterus, and that rarely they cause trouble because of their size or on account of pressure on adjacent viscera. An analysis of the 1188 cases showed that because of the degenerations in the tumors

¹ Berl. klin. Woch., May 9, 1904.

² Roussky Vrach, 1904, No. 9.

³ Zent. f. Gynäk., 1904, No. 5.

⁴ Jour. Am. Med. Assoc., May 21, 1904.

⁵ Amer. Med., Sept. 10, 1904.

about 16 % of the women would have died from the complications present. In addition, it was well known that a certain percentage would have died from the intercurrent diseases brought about by the chronic anemia present in many of these cases, and by injurious pressure from the tumors upon the alimentary canal and urinary organs. In short, at least one-third of the women having fibroid tumors, as shown by Noble's table, would have died had they not submitted to operation.

Treatment of Fibroid Tumors.—C. P. Noble¹ has estimated that because of degenerations, 16 %, and because of complications, 18 %, of patients would die without operation. Others would die of intercurrent disease contracted because of the resulting reduced state of health. If there is any class of fibroids which does not require removal, it is the subserous and intramural group. It is more than doubtful whether it is conservative to advise against the removal of a fibroid in any instance, unless, owing to disease in other organs, an operation would be hazardous. An analysis of reported cases shows the following facts: Sarcoma developed in 1.5 %; adenosarcoma of the corpus uteri in 2.5 %; carcinoma of the cervix in 1 %; necrosis in 6.1 %; cystic degeneration in 3.4 %. One-third of women having fibroid tumors die unless the tumors are removed. The risk of radical operation in uncomplicated cases is not more than 1 % or 2 %; in the average of cases it is about 5 %, rising to 10 %, 20 %, or 30 % in the gravely complicated cases. A. H. G. Doran² holds that a fibroid demands no immediate treatment when quiescent, but requires watching. The physician must be very wary about the opinions of others. The experienced physician and the successful operator are never wholly free from bias, and hence tend to oppose each other. The surgeon urges that the patient who has submitted to operation feels free from the burden of mental worry caused by the presence of a tumor, but a successful operation means more than the restoration of mental comfort to the patient. The impossibility of calculating the future growth of a fibroid is put too much in the background by the advocates of hysterectomy. The gravest possibility from this operation is the advent of psychic disturbance. When a fibroid uterus is to be removed, the retroperitoneal variety of supravaginal hysterectomy is the best and simplest operation. Doran finds that amputation above the level of the os internum, saving a portion of the endometrium, distinctly, though not very markedly, influences favorable catamenial functions. It is better to leave one ovary if it is healthy, but the advantages of conservative treatment of the ovaries have been exaggerated. Skene Keith³ believes that the real reduction in the death-rate has been obtained by the systematic discarding of the clamp and serre-nœud, the extraperitoneal operation, and the adoption of the intraperitoneal treatment of the neck of the uterus or complete hysterectomy. He is at present rather in favor of leaving the cervix, perhaps because he has done it more frequently, and also because it appears to him to be more quickly and easily performed. The opera-

¹ Jour. Am. Med. Assoc., May 21, 1904.

² Practitioner, Nov., 1903.

³ Am. Gyn., June, 1903.

tion of election may come to be complete removal. In a patient of 50 the symptoms must be severe to justify hysterectomy. Hysterectomy should be the rule in all fibrocysts, in all edematous tumors when accompanied by profuse watery discharge, in all large tumors causing symptoms, and when the patient is under 50. Even when a patient is over 50 it may be advisable to remove a tumor of 30 pounds or 40 pounds. In small tumors extending as high as the umbilicus or so, fibrocysts and edematous tumors excepted, as a general rule he advises Apostoli's treatment.

Myoma Uteri.—J. Pfannenstiel¹ gives the following special indications for operation for myoma: 1. The absolute size of the tumor without the presence of any pain; a size above a man's head may be the chief indication for operation, and much smaller in younger persons, especially if the tumor be nodular, as operation will be necessary sooner or later, and may be required at a time when the chances are far less favorable. 2. Tumors which evoke severe pain. 3. Submucous myoma with bleeding. 4. Deep-seated eccentric growing myoma, especially subvesical, causing compression of the urethra and later threatening grave injury to veins, etc. 5. Pedunculated subserous tumors inclining to torsion of pedicle. 6. All rapidly growing tumors, on account of the possibility of becoming sarcomatous. 7. Complicated cases, in so far as the complication is conditioned upon the myoma. The best time for operation is the premenstrual period. Conservative myotomy may be employed for submucous myoma or polyps of the cervix. Large interstitial, also multiple, tumors and diffuse adenomyoma should be completely exterminated without reference to the functions of the uterus, as in such cases we must choose the method which best protects the patient. In regard to mortality, there seems to be no essential difference in favor of the vaginal over abdominal total extirpation.

J. Lauper² advocates **Kocher's method of exohysteropexy in enucleation of myoma and in prolapse**, because in his opinion it possesses the following advantages: 1. The prompt appearance and easier control of any after-hemorrhage in contrast to the method in which the stump is buried deeply. 2. The greater certainty that the recovery will follow an aseptic course, especially in hematoma or necrosis of the stump. 3. The lessened danger of complication in the return of the menses soon after the operation. 4. The greater ease of the operation and the greater control of the hemorrhage. 5. The greater certainty of the procedure and the opportunity for the least mutilation of the aged. The absolute ease of executing the operation is also important in the treatment of prolapse.

The Scientific Principles of Conservative Operations in Cases of Uterine Fibromyomatosis.—G. Winter³ says the principles underlying conservative tendencies in such operations are: They preserve menstruation and the possibility of pregnancy; they prevent the disagreeable symptoms of artificial menopause. Conservative operations

¹ Deut. med. Woch., Mar. 31, 1904.

² Deut. med. Woch., Apr. 7, 1904.

³ Zeit. f. Geb. u. Gyn., Bd. lx.

do not remove the possibility of recurrence, do not offer any guarantee for a complete relief of the patient of all her symptoms, and show, whether performed by the abdomen or vagina, less favorable immediate results than the radical operations. On the basis of this consideration Winter advances the following fundamental rules for conservative myomectomy: Conservative operations are always indicated for subserous myomas with a thin pedicle if the uterus does not contain any other tumors, and for submucous myomas if they are in the process of expulsion. In such instances the size of the tumor is of little importance so long as the uterine body is freely movable and can be well pressed down into the pelvic cavity. Open for a choice between conservative and radical operation are cases of subserous myomas with a broad base; interstitial myomas in symmetrically enlarged uteruses; large submucous myomas if the cervix is closed, and multiple myomas of varying size.

The Apostoli Treatment.—G. B. Massey¹ states that a prolonged observation of cases of fibroid tumors of the uterus under this treatment teaches that three-fourths of the cases will be practically cured, as attested by inquiries made from 3 to 16 years after the cessation of treatment. The cases that respond poorly are not harmed by it when properly applied, and heroic measures may then be used. Hemorrhagic and interstitial fibroids are best adapted to the treatment, while subperitoneal or degenerative fibroids and those complicated with pyosalpinx are least so. But 1 of the 7 deaths among 110 patients has been due to progress of the growth itself, proving the nonmortal character of this affection. Of the remaining 6, 1 died of a totally unconnected affection, 1 of septicæmia under electric treatment, and 4 under operations with the knife.

The mortality of fibroid tumors of the uterus forms the subject of a letter of Dr. W. R. Williams to the British Medical Journal.² He quotes the statistics of the British Register General's office, which show a surprising mortality. Thus, for the year 1901, in a population of 32,500,000, of whom about 17,000,000 were females, the deaths caused by fibroid tumors of the uterus were 339, or a mortality-rate of about 1 in 3000. The mortality in the United States is almost exactly parallel with that of Great Britain, the census of 1900 showing that of nearly 76,000,000, comprising over 37,000,000 females, 657 died of uterine fibroid. Williams reiterates his former statement that fibroid tumor of the uterus is not often a fatal disease.

Uterine Fibromyoma with Visceral Metastases.—E. Devic and L. Gallavardin³ give extended clinical, autopsy, and histologic notes of a case which is a new contribution to the study of malignant leiomyoma. The patient was a woman of 55, who, for 7 months, had suffered from lumbar and abdominal pain. Ascites was present, also a pleural effusion, and the uterus was enlarged and immobile. At autopsy the uterus was found to be quadrupled in size and contained submucous and interstitial fibroids, with extension to the surrounding structures, especially

¹ Jour. Am. Med. Assoc., Apr. 21, 1904.

² Feb. 20, 1904.

³ Rev. de Chir., Jan. 10, 1904.

the rectum. The omentum, peritoneum, liver, diaphragm, and lungs contained secondary growths. Microscopic examination showed the uterine tumor to have the structure of a malignant leiomyoma, this also being true of the metastases. Analogous cases are very rare, only 2 others being mentioned. The histology of this tumor differed somewhat from that of a cutaneous leiomyoma previously reported, this leading the authors to state that there may be many histologic varieties of malignant leiomyomas depending on the age, the degree of malignancy, and the site of origin.

Vaginal Drainage.—Goldspohn¹ thinks that the abscesses occurring in the areolar tissue about the cervix over the vaginal vault will usually make themselves known by some encroachment upon the vaginal cavity, and should be opened from the direction in which they point into the vagina. Hematococles, and sometimes circumscribed peritoneal exudates, when they become infected, will form abscesses that are readily accessible from the posterior culdesac, and should certainly be evacuated into the vagina and obliterated by means of suitable drainage into it. If there are inflamed appendages or nonpurulent exudates higher up, they are thereby given a better chance for spontaneous improvement or recovery; and in case a secondary celiotomy is required later, it will be with less extirpation of adnexa and less mortality than would have obtained in a primary radical operation. More questionable is the proposition to drain tubal sacs which occur in distinctly organized lumens, lined with mucous membrane, or to drain ovarian abscesses because of their multilocular or honeycombed structure. But large unilocular tubal sacs can be emptied and packed; also ovarian abscesses, whose honeycombed structure can be broken down by a finger into one cavity, may be drained and solidly packed. The gauze packing in these cases should remain *in situ* at least a week—first for drainage, and then its continuous presence is needed to hold the walls of the sacs or cavities widely expanded and to arouse a layer of granulation tissue upon it by its irritation as a foreign body. In Goldspohn's experience most of the cases requiring a secondary radical operation after vaginal drainage have been those in which the affection came from the vermiform appendix. A secondary operation was required in only 10 % of the cases in which the infection came by way of the genital tract.

Exploratory Hysterotomy.—Lejars² emphasizes the necessity for direct inspection of the inner surface of the uterus, particularly in cases of hemorrhagic metritis. Frequently the condition may be found due to the existence of an unsuspected fibroma or polyp, and in this case the morbid condition may be cured with a trifling operation.

Endometritis.—Boldt,³ discussing the pathology and treatment of endometritis, speaks of the glandular, interstitial, and mixed varieties of endometritis. These formed the basis of all variations or special forms of disease. He had in a number of instances found the uterine cavity filled with polypoid nodules in which the quantity removed aggre-

¹ Am. Jour. Obstet., Nov., 1903; abstr. Amer. Med., vol. vii, No. 8, p. 324.

² La Sem. méd., vol. xxiv, No. 2.

³ Ann. of Gyn. and Ped., Jan., 1904.

gated 15 cc. to 20 cc. On microscopic examination the picture presented showed adenoma. Such conditions had been classed by some writers as a separate form—polypoid or fungus endometritis. While clinically such designation might be correct, Boldt saw no reason for classing such change under another name than adenoma of the endometrium from the point of view of pathology. Acute interstitial endometritis was recognized by the diffuse invasion of small round-cells into the stroma. Frequently pus-corpuseles were also seen, and the vessels were found to be pressed apart and compressed by the invasion of the inflammatory corpuseles. Sometimes the round-cell infiltration was found more in the deeper stratum of the mucosa in patches rather than in diffuse form. Later, when the disease passed into the chronic state, the glands became more or less obliterated, with atrophy of the endometrium. In another form of chronic interstitial endometritis the stroma cells were enlarged, contained a centrally located nucleus, and resembled sarcoma-cells to some extent. The mixed forms of endometritis showed that changes were present in both glands and the interstitial connective tissue. Of the forms of tuberculous endometritis, the ulcerative variety was usually encountered. The acute milia-ry and the interstitial varieties were seldom seen. Primary tuberculous endometritis is a rare disease. While the etiology of all specific forms of endometritis was well understood, those not depending upon microorganisms and ptomains, in many instances, had uncertain causative factors. The local treatment giving the promptest relief from bleeding in instances of chronic endometritis was undoubtedly to be found in the judicious use of the curet.

Chronic Metritis and Endometritis.—W. E. Fothergill¹ reviews some of the recent writings on these so-called conditions, with special reference to their relation to the life-history of the uterine muscle. The works of several writers who have endeavored to elucidate the pathology of numerous conditions that are still called "endometritis" and "metritis," though noninfective in origin, are considered at some length. The investigations of Theilhaber, Meier, and Donald are interpreted as certainly proving the existence of a noninflammatory condition, in which the symptoms are discomfort, menorrhagia, and leukorrhea, and the most obvious pathologic feature is hypertrophy of the uterine mucosa. Fothergill says it must be allowed, even if the conclusions of these observers are not accepted as final, that the uterine muscle plays a greater part in the causation of common pelvic disorders than has hitherto been recognized. The application of names ending in "itis" to conditions of noninflammatory origin is not in accordance with the spirit of modern pathology. The terms endometritis and metritis should be reserved for infective cases.

Senile Endometritis.—L. H. Dunning² says that the affection is more common than is generally supposed, constituting about 3 % of all the pelvic troubles among women. There are 2 forms—acute and chronic. The former may be due to gonorrheal infection, but other

¹ Practitioner, Mar., 1904.

² Jour. Am. Med. Assoc., Sept. 17, 1904.

germs may be the etiologic factor. It not infrequently results in abscess in the adnexa. Thorough drainage, dilating the cervical canal if necessary, is the main thing in the treatment. No curetment should be done until acute symptoms subside. The application of carbolic acid and other medicaments to the interior of the uterus may be helpful. The chronic form is often a mere continuation of the acute. This is sometimes so severe and persistent as to require hysterectomy. The histologic findings in both forms are dwelt upon, several illustrative cases reported, and illustrations exhibited.

Hysterectomy for Infectious Disease.—H. C. Deaver¹ outlines the early treatment of infectious disease of the uterus and uterine appendages. When the infection has passed into the tube, forming a pyosalpinx or tuboovarian abscess, he always operates through the abdominal route, tying off the ovarian vessels as close to the pelvic wall as possible, and rapidly excising the tube and ovary with scissors, following the incision right to the horns of the uterus, and closing the resulting wound with a continuous suture. He then drains with gauze, being careful to place the gauze along the line of suture. When the infection manifests itself as a phlebitis of the uterine sinuses and veins of the broad ligament, and is associated with small and multiple abscesses of the uterine walls, as well as with acute peritonitis, he believes that an early operation is indicated. When infections of the uterus occur from gonorrhea, dermoid cysts, and from interligamentary and ovarian cysts, he performs a supravaginal hysterectomy. Supravaginal hysterectomy in badly infectious cases with dense adhesions he considers the ideal operation, for it thoroughly removes all the diseased condition, and the floor of the pelvis may be left with a serous covering by neatly stitching the opposed serous surfaces together.

Tuberculosis of the Uterus and Appendages.—J. H. Targett² states that in 500 necropsies of females who died of tuberculosis in Brompton Hospital for Consumptives the genital organs of 7.7 % were found affected. Of the organs affected in genital tuberculosis, the fallopian tubes are to be found the most frequently, and are involved in about 90 % of the cases; the forms may be diffuse miliary tuberculous salpingitis, caseous tuberculous salpingitis, and tuberculous pyosalpinx. Tuberculosis of the uterus is usually the result of infection from the tubes. There is a great difficulty in accurate diagnosis of acute tuberculosis of the tubes, but in chronic lesions there is much better chance of a correct diagnosis. The previous history is of importance and the absence of other adequate causes of the disease is a valuable guide. Sterility is usually present in the chronic forms of tuberculous salpingitis, especially pyosalpinx. On the other hand, pregnancy seems to hasten the development of tuberculous peritonitis, not a few cases of which follow rapidly upon a confinement, and they often do badly. Dysmenorrhea is a common symptom, and the absence of pelvic pains is worthy of note. It may be stated generally that the tuberculous

¹ N. Y. Med. Jour., Jan. 2, 1904.

² Brit. Med. Jour., Oct. 17, 1903.

process is unaccompanied by pain so long as it remains free from secondary infections by pyogenic organisms.

Anteflexion of the Uterus.—Wadsworth¹ gives a painstaking analysis of the results in the cases of Dudley's operation performed at the Free Hospital in the last 2 years. Dudley's operation was performed for the relief of dysmenorrhea in 21 cases in which anteflexion was the only discoverable cause of the symptoms. Of these, 6, or 28.5 %, were entirely relieved 5 to 14 months after operation. Thirteen, or 67 %, were partially relieved in from 4 to 20 months after operation. In 2 cases, or 9.5 %, no benefit was received. Two patients have become pregnant.

Chronic inversion of the uterus, according to Reuben Peterson,² is best treated by increasing the diameter of the inversion ring. This may be done either by pressure from within outward or through incision of the pillars of the ring. The various operations that have been advocated in this condition are divided into 4 groups: (1) Partial posterior colpohysterotomy (Küstner's operation), which gave 4 successes in 6 operations (Küstner), Perlis (von Jordon) and 2 failures (Salin Weber); (2) complete posterior colpohysterotomy (Piccoli's operation); (3) partial anterior colpohysterotomy (Kehrer's); (4) complete anterior colpohysterotomy (Spinelli). The vaginal methods collectively show 26 cases, with only 3 failures and no deaths, or 88 % successful.

Fresson,³ in discussing the condition, advances the following rules: (1) In every case of inversion, acute or chronic, manual reduction should be attempted; (2) in all acute cases and those chronic cases in which the obstacle to reduction is a constricting ring, bilateral incision of the cervix should be used; (3) in cases not coming under these heads the best operation is that of colpohysterotomy. (4) Vaginal hysterectomy is indicated only in the presence of intractable hemorrhage, infection, or when the irreducible uterus has been so injured that there is no probability of its regaining its functional integrity. (5) Hemisection is the most rapid and convenient method of extirpating the organ.

Treatment of Prolapsus Uteri.—An editorial in *American Medicine*⁴ says that it is somewhat surprising to an American gynecologist to note that Küstner, of Breslau, is an advocate of pessary treatment for prolapse of the uterus, and that he believes that the pessary insures a better position than any operation. We are willing to admit that the pessary has an important place in the armamentarium of the gynecologist, and that there is a class of cases in which the administration of an anesthetic, the age of the patient, or some physical condition contraindicates operative procedures, but which may be relieved by the prosthetic method. However, there are many women who are extremely averse to wearing a foreign body in the genital canal and want a permanent cure, rather than temporary relief, for the malposition of the uterus. And such relief can most certainly be afforded by the selection of suitable operative procedures. It seems somewhat antiquated,

¹ Bull. Free Hospital for Women, vol. iii, No. 1.

² Ann. de Gyn. et d'Obstet., Oct., 1903.

³ Am. Gyn., June, 1903.

⁴ Aug. 8, 1903.

in the face of the splendid results attainable, to return to the pessary in these cases. No one operation is sufficient or applicable in every case; the average patient suffering from a prolapse of the uterus of the second or third degree usually requires 5 operations, which may be done at one sitting: (1) A curetment of the uterus, which is indicated to restore the endometrium to a normal condition; (2) either an amputation of the cervix of the infravaginal portion, if much hypertrophied, or a repair of the cervical tears which are almost invariably found in cases of marked prolapse; Schroeder's method of single-flap amputation of the cervix is a very satisfactory one, as it removes the eroded and inflamed cervical tissue; (3) an anterior colporrhaphy is usually required for the restoration of the anterior vaginal wall in cases of extensive cystocele, and where the malposition is of long standing it is often necessary to take a reef in the base of the bladder in order to restore it completely to its normal situation; (4) a perineorrhaphy, either by the method suggested by Emmet or Hegar, will effectively restore the pelvic floor; (5) an abdominal incision, with either ventral suspension or fixation, or a shortening of the uterosacral ligaments in order to maintain the uterus in its proper position of anteversion so that the intraabdominal pressure will be directed upon the posterior wall of the uterus rather than upon the fundus, driving it downward into the axis of the vagina. By this combination of operations the vast majority of the cases of uterine prolapse can be permanently relieved. It may be well to say a word or two as to the value of prophylaxis. The early treatment of retroversion of the uterus and the prompt repair of lacerations of the pelvic floor will do much to prevent prolapsus and to render the quintuple operation unnecessary. There is a certain proportion of cases in which extirpation of the uterus is indicated, particularly when there is erosion or ulceration of the cervix and when the possibility of incipient malignant disease is present. Bumm, of Halle, has reported a series of 105 patients treated by total extirpation, 93 % of which have regained their complete working capacity. His mortality has been 2 in 105, and in 176 cases reported in literature the mortality was 6.9 %.

Remote Results of Operations for Prolapse.—M. Jacoby¹ analyzes 257 cases of prolapse of the womb treated by different operative procedures; about 77 % could be traced for the purpose of investigation. Jacoby is of opinion that in every operation for uterine prolapse the most essential point is to correct whatever displacement of the uterus itself may exist, and that each case must be treated upon its individual merits without adoption of any routine method.

The significance of retrodisplacement with reference to symptomatology is discussed by Eden,² who states that in many cases retroversion of the uterus does not require treatment. He quotes Schroeder's statistics in evidence. This observer carefully investigated the position of the uterus in 411 hospital patients and others, anesthesia being employed for the examination whenever necessary. Of this number, 93

¹ Arch. f. Gyn., No. 70, vol. iii.

² Practitioner, May, 1904.

were healthy individuals and expressed themselves as feeling perfectly well. Two-thirds of the total number, according to Schroeder, had no "pelvic symptoms" whatever, yet he found in 26 % of these, awkward displacement of the uterus. Among the 93 healthy persons, 23.6 % had backward displacement. Looking at his figures from another aspect, we see that in 118 cases of backward displacement 2 out of every 3 were unaccompanied by any pelvic symptoms. If the nulliparous women are considered alone, we find that in 30 cases of backward displacement 4 out of every 5 had no pelvic symptoms. These observations prove conclusively that backward displacements of the uterus frequently give rise to gynecologic or other trouble, and, further, that this appears to be especially the case in women who have borne no children. In considering the treatment of retroversion, Eden states that pessaries should be used only as a temporary measure in simple cases. They rarely effect a cure. The objections to the pessary are briefly stated: (1) That it frequently fails to achieve its object—the restoration of the uterus to a position of anteversion; (2) its use once begun can seldom be discontinued—*i. e.*, it is palliative, not curative; (3) it is a dirty method, and may lead to inflammation, ulceration, or sloughing of the vaginal walls. For these reasons he regards the use of a pessary as a temporary measure only, and restricts its application to those cases alone in which temporary measures will suffice. The frequent failure of pessaries is the chief count in the indictment against them. This failure is now generally admitted by writers who have taken the trouble to record and analyze a series of cases. Thus Sänge reports that of 49 cases treated by pessaries, only 7 cases (14.3 %) were cured, while 42 (85.7 %) were unrelieved. Fränkel, out of 294 cases treated by pessaries, could report only 8.2 % of cures. On the other hand, Klötz and Prochownick have reported 24 % to 25 % of cures, but a method by which so small a proportion of cures can be obtained as 8 % to 25 % cannot be recommended with any degree of confidence. In that large proportion of cases in which operative treatment is demanded Eden prefers ventrofixation. After briefly giving his objections to the various other methods of elevating the uterus he considers the advantages of ventrofixation: (1) It is applicable to all cases; (2) it allows such complications as adhesions to be readily dealt with at the same time; (3) it gives a permanent correction of the displacement; (4) it involves no serious complication in subsequent labor when properly performed; (5) it involves no more risk to the patient than that of opening the peritoneal cavity, which, with modern asepsis, is extremely small. The general conclusions of the paper are summed up as follows: 1. Backward displacement of the uterus frequently gives rise to no symptoms and requires no treatment. These are usually cases of "simple" displacement. 2. When symptoms are caused by it, complications are usually present which may be either "consecutive" or "independent." 3. Before adopting local treatment, the possibility of the symptoms being hysteric should be carefully considered. 4. Pessaries should be adopted only as a temporary measure or in "simple" cases; they rarely effect a cure. 5. Local depletion

is a valuable adjunct to treatment by pessaries. 6. Cases unsuitable for treatment by pessaries, and cases in which pessaries have failed to cure, should be advised to undergo ventrofixation.

The Clinical Importance of Retroflexio Uteri.—G. Winter's¹ researches have shown that of 710 apparently normal women, 154 had retroflexed uteruses; of these 154 women, 90 (60 %) complained absolutely of no gynecologic symptoms. A closer examination of the symptoms complained of by women with this condition revealed that in nearly all cases the symptoms are due to some coexisting complication. Of 90 women with retroflexion complaining of symptoms which were at first believed to be due to the retroflexion, 88 were found to have a complicating condition: 6 were pregnant, 5 had puerperal hemorrhage, 6 prolapse, 15 catarrh, 31 adnexal disease and perimetritis, 13 parametritis, and 3 had rarer complications. Upon removal of the complications the symptoms claimed to be due to the retroflexion disappeared; only in the case of puerperal hemorrhage was it necessary to treat the retroflexion. He found further that the complications did not produce the retroflexion, nor the retroflexion the complications, even where it had existed for years, nor was it capable of producing diseases of the nervous system, as hysteria. The treatment of retroflexion, therefore, is the treatment of its complications. Simply to operate on a healthy woman because she has retroflexion is absolutely uncalled for. Ernest J. Mellish,² in an article analyzing the etiology, etc., of the condition, reaches the following conclusions: 1. Rarely, retroversion is congenital, and it is common in virgins. It is probable that improper clothing during the period of puberty, together with lack of exercise and of development, act as causative factors in fully as many cases of retrodisplacement as subinvolution after parturition. 2. Retroversion is essentially a pathologic condition, in that it is, either directly or indirectly, in the majority of cases, a source of discomfort or disease. 3. Retrodeviations are present in at least 15 % of all gynecologic patients. 4. The intelligent use of the pessary will effect a cure in a large percentage of the cases, but when used unintelligently, the pessary is positively dangerous, as is the case with most surgical instruments and appliances. 5. Surgical treatment of retrodeviations is absolutely essential to a cure in a large proportion of the cases. 6. The Alexander-Adams operation of shortening the round ligament is right in principle, and will, more or less modified, maintain its position as a classic operation for the cure of retrodisplacements. 7. No method of shortening the round ligaments within the abdomen will effect a cure in nearly all cases, because these methods fail to eliminate the weakest part of the ligament—the portion within the inguinal canal. 8. The Gilliam modification of the Alexander-Adams operation is the operation of choice in these cases, because it is easy of execution and meets all the indications for the successful treatment of the displacement and of intraabdominal complications which may be present. 9. Ventral suspension and ventral fixation are "unphysiologic" operations. They should not

¹ Wien. klin.-therap. Woch., 1904, No. 1.

² Amer. Med., Aug. 27, 1904.

be performed in the cases of patients susceptible of childbearing. 10 Vaginal operations for retrodeviations in fruitful women are mentioned only for condemnation. C. W. Oviatt¹ agrees with the experienced gynecologists that uncomplicated retrodisplacements rarely cause disturbing symptoms. Morissette² gives the following as his conclusions: (1) The treatment of retrodeviations favors fecundation in sterile women; (2) in recent, mobile deviations the pessary may be employed with success; (3) the period of genital involution is truly the psychologic period for the pessary; (4) where the perineum is intact and there is no lesion of the adnexa, the Alexander operation is the one of choice. Where there are adhesions to the adnexa, laparotomy is indicated, followed by simple abdominal fixation and transfixation and transfixation of the round ligaments; (5) in the case of multiparas where the perineum is torn, fixation should be associated with plastic operations upon the cervix, vagina, and perineum; (6) in the case where retroversion is present and complicates pregnancy, medical manual reduction of the deformity should be practised. If this does not suffice to free the uterus from the pelvic cavity, celiotomy should be done and the round ligaments should be fixed intraabdominally, with a view to a direct reduction of the abnormality and for a definite cure of the deviation. Young,³ after describing the mechanism of retroversion, states that the ideal operative procedure is Bessell's operation. Young formulates his deductions as follows: 1. Retroversion and retroflexion are never simply malpositions of the fundus, but complex changes in the relation of the whole uterus to the other structures in the pelvis and to the pelvic wall. 2. The uterosacral ligaments are the only suspensory ligaments of the uterus when the patient stands, and are the only ligaments not affected by gestation or parturition. 3. The uterosacral ligaments suspend the uterus by their attachment to the lower segment and act as a swing in supporting the rectum. Factors causing the yielding of these ligaments are: Injuries to pelvic diaphragm; increased intraabdominal pressure; constipation; straining at stool; injuries to the rectovaginal septum, causing retraction of anus, with rectocele. 4. Any method for the relief of these conditions must consider and relieve all the complicating lesions, not the least of these, the pathologic condition of the endometrium. 5. All methods for holding the fundus forward must rely upon the integrity of the uterosacral ligaments, together with the fibrous connective tissue of the broad ligaments to suspend the uterus. 6. Nonoperative measures are applicable to acute traumatic and replaceable noncomplicated cases, and depend for their value upon relief of pelvic engorgement, the restoration of normal circulation, and the return of normal elasticity and tone to the ligaments and muscular structures. 7. The Alexander operation has a limited field of usefulness, and is of value only when there is retroflexion and the other ligaments are strong enough to support the uterus, with proper relief of other complications. It must never be forgotten that traction on the round ligaments tends

¹ Jour. Am. Med. Assoc., April 16, 1904.

² La Gyn., June, 1903.

³ Med. Rev., Oct. 24, 1893.

to lower the plane of the uterus. 8. Ventral suspension, when performed in combination with other procedures, does relieve the malposition and prevents a recurrence of the same. Its dangers, when properly performed, are small, if any, in subsequent pregnancies. The advantages of the operation are the ease and rapidity of its performance. 9. Ventral fixation is applicable only when the patient has passed the child-bearing period. 10. The ideal procedure is as follows: Curetment, repair of injuries to the cervix, retrovaginal septum, and anterior wall of the vagina; laparotomy; sacrosuspension; Bessell operation. The disadvantages are the length of time necessary for the operation and its difficulty of performance in fat subjects. 11. In place of the Bessell operation, a ventral suspension may be substituted. This, I believe, is wise when many adhesions have been broken up and the posterior surface of the uterus is denuded of peritoneal covering, or the patient's condition demands haste. 12. In nulliparas a pessary should be worn for 6 months to prevent traction on the uterosacral ligaments until they have regained their tone. The action of the pessary is due to the fact that resting on the superior surface of the symphysis the lower segment of the uterus is held upward and the strain taken off the uterosacral ligaments. The rectocele, when no lacerations exist, is in this manner lessened. 13. The uterus should be curetted as the first step in any of these operations. 14. The adhesions so frequently found in these cases are of the greatest value to the patient in that they fulfil a munificent purpose of nature in preventing the condition of complete prolapse during the existence of the malposition.

Vesicofixation of the Uterus.—Hawley¹ is of opinion that vesicofixation is the best relief for retrodisplacement of the uterus without adhesions, provided these persist after treatment and produce symptoms increased by slight exertion, such as backache, dragging sensations, and neuralgia, and in the absence of chronic constipation and dysmenorrhea. He is of opinion that the operation is superior to the Alexander operation because it allows inspection and thorough examination of the adnexa, and affords opportunity for treating endometritis and any other existing abnormalities of the external genitals. He thinks that stress must be laid upon the absence of visible scar, the less degree of danger, and the shorter period that the patient must remain in bed.

Various modifications of the Alexander operation are described; among them N. Bardescu² describes a new procedure for the relief of retrodeviation, which he has employed in a number of cases with entirely satisfactory results. The operation consists of 2 parts: (1) The treatment of the lesion and the reduction of the malposition; (2) suspension of the uterus by a displacement of the round ligaments. This operation, though described as new, appears to be merely a modification of the operation of Gilliam. This latter procedure furnishes some interesting statistics. Ill has performed 126 operations for retrouterine displacements, of which 86 were done by the Gilliam method. There were no deaths. A personal report has recently been received from 61

¹ Am. Gyn., May, 1903.

² Zent. f. Gynäk., 1904, No. 3.

of these cases, and 51 report themselves as entirely well, 6 as markedly improved, and 4 as no better. Five were pregnant and 2 had given births normally. Only 1 case is reported as a recurrence of the displacement. In this case, in opening the abdomen to ascertain the cause, it was found that the part of the round ligament beyond the suture was atrophied, while the near end retained its normal thickness. The atrophy was probably due to the fact that the ligature was drawn tight, strangulating the central artery. In considering the **failures of his operation** Alexander¹ says that the most essential points of his operation are sometimes left out by other surgeons. Alexander does this operation in the majority of cases for retroflexion. The **objections to the Alexander operation** are very clearly stated by Hooper.² His objections fall under 3 heads: (1) Shortening of the round ligaments (the Alexander-Adams operation) is a fixation of the uterus, and consequently open to all objections of such operations. (2) This particular operation is inapplicable to the virgin and child-bearing woman. (3) Unless the uterus is fixed, it returns after parturition to its retrodeviated position.

Disadvantages of Ventrofixation.—G. W. Maly³ gives the history of 2 cases of ventrofixation, showing how each patient suffered repeated pregnancies, ending in abnormal deliveries, in most cases, of asphyxiated children. Also in both cases, united with other consequences, there was a hemming-in of the intestines. Maly remarks that since in later times gynecologists have ceased to see any pathologic condition in a movable reflexed uterus, but only in the complication of its fixation in the backward position, it may at least be designated as illogical to convert a fixed retroflexed uterus into a fixed anteфлекed one, since the pathology lies in its fixed condition. In the second case reported the os uteri was drawn up above the promontory, and the external os uteri, which normally opens in the direction of the pelvic axis, opened backward against the promontory. After the objections mentioned Maly will not entirely condemn ventrofixation, which at times offers great advantages to the patient, but deems it necessary to call attention to the real dangers and disadvantages which belong to the unphysiologic position of the uterus resulting from this method.

The Avoidance of Ventrofixation of the Uterus.—F. Spaeth⁴ reports 3 cases in which, after laparotomy according to Pfannenstiel and the removal of ovarian cysts and tumors, the retroflexed uterus was restored to its normal position by shortening the round ligaments; and he believes that when an abdominal incision is necessary, this method is the procedure of the future, as it avoids all the disadvantages of ventrofixation.

D. J. Brown⁵ discusses the various **malpositions of the uterus**, and says, in regard to the treatment of retrodisplacement, that we have 2 distinct purposes in view: The bringing forward of the uterus to its nor-

¹ Med. Press and Circ., Apr. 29, 1903; abstr. Amer. Med., Sept. 5, 1903.

² Intercol. Med. Jour. of Australasia, July, 1903.

³ Zent. f. Gynäk., Jan. 30, 1904.

⁴ Zent. f. Gynäk., Apr. 30, 1904.

⁵ Boston M. and S. Jour., Aug. 11, 1904.

mal position, and its retention in the corrected position. Taking into consideration the wide range of mobility exercised by the normal uterus, careful nonsurgical treatment should be first considered. This should depend upon the symptoms, duration of displacement, and complications. The treatment essentially is to replace the uterus by bimanual manipulation from the vagina and abdomen. If a vaginal manipulation fails, the finger should be introduced in the rectum; the knee-chest posture should be assumed, if necessary; if all these fail, an anesthetic should be administered, when complete relaxation will, in almost all cases, permit reposition of the displaced organ. A pessary should now be used to retain the organ in position, especially if displacement has been of short duration; if of long duration, sterile tampons saturated with ichthyol or glycerin and packed firmly against the surface should be used daily until tenderness disappears, and then a Hodge-Smith pessary should be used. Brown formerly practised ventrofixation or ventrosuspension, depending upon the age and general condition of the patient, but he has ceased to use them, regarding either as dangerous to the future welfare of the patient.

Ultimate Results of Ventrofixation.—Dolbert,¹ in analyzing the final results in 79 cases of ventrofixation performed in St. Petersburg clinics since 1896, states that in 43 the cause for operation was retroversionflexion; in 36 cases it was done for prolapse of the first group. The patients were generally thin and undernourished women who had never had any children or at most but one; in 3 the retroflexion was movable; in 18 fixed; and in 34 it occurred as a complication of some affection of the adnexa, this being the main indication for operative intervention. From the results he concludes that ventrofixation is not more liable to be followed by a hernia than any other laparotomy, and has no greater degree of danger. In every instance but one the uterus remained permanently in its new position, and in this instance the uterus was much enlarged and should not have been fastened in this way. The subjective symptoms, however, returned in more than one-third of the cases, indicating, in Dolbert's opinion, that the neurosis apparently attributable to the displacement is in reality more or less independent of it, occurring for the most part in subjects with a neurasthenic or hysteric tendency.

Intraperitoneal Shortening of Ligaments with Exclusive Use of Catgut.—Menge,² having observed the frequent bad effects of ventrofixation of the uterus and the evils resulting from the use of non-absorbable material, is convinced of the advantage of the intraperitoneal shortening of the ligaments which gives the uterus a complete physiologic position, and also of the exclusive use of absorbable material. The round ligament is grasped near the middle by forceps and drawn in front of the anterior lamella of the broad ligament; after the two parts of the loop thus formed are sutured together as usual, the loop at its angle is firmly sutured to the anterior uterine wall near the fundus, and thus the uterus is brought into a position most nearly physiologic. The bladder

¹St. Petersburg. med. Woch., vol. xxviii, No. 20. ²Zent. f. Gynäk., May 28, 1904

retains its free action and the adnexa remain outside the operation field. His method has brought uniformly good results, with no disturbance during pregnancy or labor. He employs this method only in cases of fixed retroversion. If the uterus is movable, only the Alexander-Adams operation is used.

Ventrosuspension and Pregnancy.—V. Guerard¹ says that interference with subsequent labor is not known as a complication of ventrosuspension if the operation is properly carried out. He gives statistics: in 57 births, among 53 women who had had ventrosuspension performed, there were 52 spontaneous deliveries. Forceps were used 5 times for various causes. Again, among 39 patients who had been operated upon by vaginofixation, there were 41 births, in 4 of which forceps were used at the outlet, the deliveries being otherwise normal. The question of abortion in these cases is also of interest. In Guerard's series of 57 deliveries after ventrosuspension there were 7 abortions, and in the 41 deliveries after vaginofixation there were 7 abortions. The uterus returned to its retroverted position in 2 of the cases of ventrosuspension and in 1 of the series of vaginofixation.

Effect upon Pregnancy of Operations for Uterine Displacement.—H. P. Ritchie² reviews the 154 operations performed by McLaren. Pregnancy has occurred 25 times in 21 cases; there were 6 miscarriages, but in only 2 of the cases could the operative procedure be held responsible. One of the patients could never have gone to term without the second operation, which permitted such termination of pregnancy. Ritchie ably discusses the various operations and evolves these conclusions: 1. Fixation by broad attachment of the uterus to the abdominal wall in a woman of child-bearing age is contraindicated unless accessory procedure prevents pregnancy; if pregnancy is not to be considered, it is the operation of choice. 2. The objection to suspension operation lies in the difficulty of obtaining a surgical result that is nonobstructive to uterine growth. 3. The use of the round ligaments in any way suggested offers no obstruction to enlargements of the uterus, and discussion on their use must be limited to the methods best suited to support the uterus. 4. The uterus will, by its own weight, pull away from an artificial ligament attached anteriorly to the face of the fundus, and it will also pull away from the round ligament so attached. 5. Thus far the round ligament sewed to the posterior wall of the uterus, although the cases are few, seems to meet the requirements.

Posterior Cervicovaginal Fixation.—Under this name Goelet³ described an operation which aims at overcoming the displacement by holding the cervix permanently backward in the hollow of the sacrum, and doing away with the necessity for a pessary; making use of the posterior vaginal wall for the attachment of the cervix, which under normal conditions is rather firmly connected with the anterior wall of the rectum. The success of the operation depends upon the close attachment of the vagina to the rectum, at its upper portion in particular.

¹ *Monats. f. Geb. u. Gyn.*, 1904, 2.

² *St. Paul Med. Jour.*, Aug., 1904.

³ *Internat. Jour. of Surg.*, July, 1903.

Hence the operation has a limited field, because in some cases there is a very loose connection between the vagina and rectum, or sometimes the rectum is permanently dilated and the vagina cannot be utilized for securing a fixed point for the cervix. In those cases, however, where the above-named condition is normal, the operation has thus far proved satisfactory. **Technic:** The operation may be done under general or local (cocain) anesthesia. The former is more satisfactory, because it affords perfect relaxation for manipulation, not possible with the latter. The patient is placed on the back in the exaggerated lithotomy position. The vagina and vulva are cleansed in the usual manner by scrubbing; then the surface of the vagina and cervix is dried and painted with



Fig. 43.—Posterior cervicovaginal fixation, showing denudation of both surfaces and position of approximating sutures (Goelet, in *Internat. Jour. of Surg.*, July, 1903).

tincture of iodine to stain it and render it aseptic, or a solution of methylene-blue may be used for this purpose. An area about one-half inch square upon the posterior surface of the cervix is denuded of its mucous membrane, and a similar surface upon the posterior vaginal wall well up in the sulcus behind the surface is likewise denuded. These denuded surfaces are then approximated by deep sutures, as shown in the accompanying illustration (Fig. 43). These sutures are inserted from in front backward under the denuded area upon the cervix, and from behind forward under the denuded area upon the vaginal wall. Three or 4 of these sutures will usually suffice, and when they are tied, the cervix is drawn backward and the fundus thrown forward, as illustrated in Fig. 44. The suture material used is silkwormgut, which may be retained until firm union has been secured. To render it more conspicuous for con-

venience in removing the sutures the silkwormgut is stained previously with methylene-blue. A tampon of gauze is placed against the cervix, to take the strain off the sutures and to keep the surface of the vagina dry. This is removed on the second day, and may be renewed or not as the judgment of the surgeon may dictate. The patient is put to bed for a week, but is encouraged to rest upon either side rather than upon the back while in bed, and when she gets up, she is cautioned to exercise moderate care for 2 or 3 weeks to avoid exertion that would put strain upon the uterus. The sutures are not removed until the end of the second or third week, or not until it is certain that firm union has been secured.

Perforation of the Uterus by Curet.—Fairchild¹ discusses the cause leading to accidental perforation of the uterus and lays down the

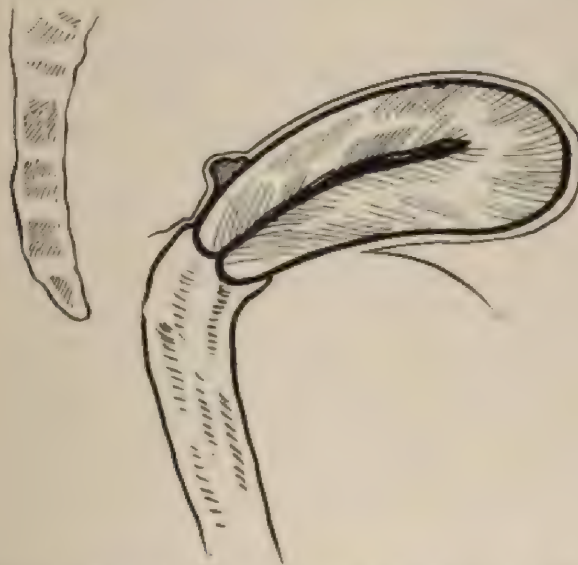


Fig. 44.—Posterior cervicovaginal fixation, showing surfaces approximated and rectified position of uterus (Goelst, in *Internat. Jour. of Surg.*, July, 1903).

following rules for treatment: If the perforation is small and made with clean instruments and if irrigation is not employed, rest and the application of ice will generally be followed by recovery, with probably nothing more serious than a circumscribed peritonitis. If irrigation has been employed, one of two courses of action will be necessary. If the infection is mild, the treatment by rest and ice may be sufficient. If the infection is of a character to excite a septic peritonitis, a vaginal hysterectomy with drainage will be indicated. In the milder form of infection there is danger of chronic inflammatory processes occurring in the pelvic connective tissue or peritoneum, leading to abscess formation and the train of sequences which so often attend chronic infection

¹ *Jour. Am. Med. Assoc.*, Mar. 9, 1904.

in this region, and will require the treatment usually demanded in such condition. If the perforation is more extensive or is made with a large-sized curet, the fundus may be delivered through an anterior vaginal incision and the wound in the uterus closed by sutures, or, as will happen in some cases of perforation resulting from a curettage preliminary to some operation on the uterus through the abdominal wound or by the vaginal route, the choice will be a suturing of the wound or a hysterectomy, as the conditions may indicate.

Uterine Curetment.—D. H. Craig,¹ while highly commending certain portions, criticizes other portions of an article by Dr. Van De Warker in the *New York Medical Journal* of October 10, 1903, entitled, "The Dangerous Operation of Uterine Curetment." Craig does not agree that it is right to characterize the operation of uterine curetment as dangerous in the abstract, or in the hands of those competent to undertake the performance of any surgical procedure. He says that the greatest danger incident to curetment, taking thorough modern asepsis for granted, is perforation of the uterine wall. He is not in favor of tamponing the uterine cavity, for he says no matter how strenuous the effort, it is probable that absolute asepsis is never achieved. The tamponing of the cavity with gauze immediately after a curetment and while the abraded surfaces are still the site of more or less abundant hemorrhage, furnishes a mesh in which the blood will clot and remain within the cavity, instead of draining away by simple force of gravity. This blood-clot presents an admirable culture-medium upon which the relatively few organisms present may rapidly multiply. It is far more rational thoroughly to clean the cavity during the operation and then to leave the blood and exudates free to drain through an amply dilated cervix, thus tending to wash away organisms. It is wisest to avoid douches of any kind for the first 48 hours, or until the cervix has had time to retract so far as to leave little possibility and no liability of washing material from the vagina into the cervical or uterine canal.

Hysterectomy.—John O'Connor² describes a method which, while not new, is yet very practical. Under anesthesia the patient is placed in the laparotomy position, two Sims' speculums are introduced, and the cervix is grasped with forceps; with curved scissors the vaginal mucous membrane surrounding the cervix is severed through the entire circumference; the forceps remain, but the speculums are withdrawn and the patient placed in the supine position. The abdomen is opened in the usual way, intestines packed off with gauze, and a nurse is directed to place a hand between the thighs, and, grasping the forceps left on the cervix, she pushes strongly upward. The vesical peritoneal reflexion is divided transversely, and the bladder is separated from the uterus in the usual manner. The uterus is then pulled forward, and the peritoneum on the posterior aspect divided transversely. The ovarian and round ligaments are ligated and divided, the broad ligament severed, forceps grasping the uterine arteries as they are divided, and the uterus is removed. If the cervix has previously appeared

¹ *N. Y. Med. Jour.*, Mar. 19, 1904.

² *Lancet*, Aug. 27, 1904.

healthy, the vagina is closed by continuous catgut suture; if not, or if oozing continues, the vaginal suture is omitted and the peritoneal flaps are sutured.

Value of Conservative Operations on the Uterus and Its Appendages.—W. P. Manton¹ says that while in a very large proportion of the patients that consult the specialist regarding disease of the pelvic organs the conditions have lasted for so long that conservative treatment is impossible, there remains a good percentage of cases in which the removal of the pathologic process is possible without destruction of the entire organ. He reports 62 conservative operations on the uterus and appendages in 53 patients during the past 5 years. These include myomectomies, resection of ovaries and tubes, and puncture of cystic ovaries. Of the cases reported, there have been 94.3 % of symptomatic cures, 5.6 % of failures, and 5.6 % of pregnancies. There were no deaths. In formulating conclusions regarding reconstructive surgery note must be taken of the more rapid convalescence, the more satisfactory improvement in the general health of the patient, the maintenance of the reproductive organs, and the possibility of future pregnancy.

Hernia of the Uterus Through the Inguinal Canal.—J. H. Jopson² reports a case in which operation was performed, the usual incision being made. The hernial sac was opened, and a pear-shaped mass exposed. During manipulation the mass split, and some free pus escaped from its interior. Presently an ovary was discovered, and it was then ascertained that the hernial mass was the uterus turned forward, the supravaginal portion running downward, backward, and inward to the cervix. Removal of the infected uterus was deemed necessary. This was done, together with the prolapsed ovary, the supravaginal portion being anchored in the external abdominal ring.

Intrauterine Medication.—P. Zweifel³ classes the dangers of intrauterine injection as threefold: The introduction of air, the absorption of poison, and septic infection. He refers to cases in which, in spite of the greatest precautions, the injections were followed by alarming results, such as fainting, nausea, attacks similar to eclamptic convulsions, and changes of temperature. He considers chlorin solution the most dangerous of any of the medicaments used. In all intrauterine injections in gynecologic cases he advises the use of the minimum measure of fluid made practicable by a graduated syringe. Finally, he advises use of the mildest medicaments only. That one should undertake intrauterine treatment only when there is no uterine inflammation is a matter of course. Even then the least dangerous remedies and methods must be used as less dangerous than injections when there is a normal width to the os uteri, painting with a brush or a flat stick of silver or nickel to introduce the required substance may be used.

Five Successful Hysterectomies in One Family.—J. McPherson Lawrie⁴ tells of a family of 9 sisters which furnished 5 examples of fibroid disease with 5 successful hysterectomies.

¹ Jour. Mich. State Med. Soc., Oct., 1903.

² Deut. med. Woch., Apr. 21, 1904.

³ Ann. of Surg., July, 1904.

⁴ Brit. Med. Jour., Feb. 13, 1904.

Vesicular Mole of Unusual Size.—T. S. Jones¹ reports the case of a woman of 48 who had had 8 children and who, when he first saw her, had had no menses for some months and was having strong labor-pains, with copious, sanguineous discharge, in which could be seen an occasional cyst of the hydatidiform variety. Under chloroform the mass of cysts was removed from the uterus by hand without much difficulty. The whole mass of cysts weighed $5\frac{1}{2}$ pounds, and presented somewhat the appearance of grapes, the cysts being attached one to another, instead of to a common stem, and varying in size from $1\frac{1}{2}$ inches in length to the size of a pin's head. The patient made an uneventful recovery. Five years before she passed a similar though smaller mole, since which time she had borne a child at full term, though decidedly syphilitic.

THE TUBES AND OVARIES.

Conservative Surgery of the Uterine Adnexa.—Edward L. Twombly² states that an exploratory incision should be made in an ovary which has been the seat of constant pain, with exacerbations during the menstrual periods, even if it appears normal or slightly enlarged. The same procedure should be done in both ovaries when there have been constitutional symptoms pointing to the ovaries, when they seem normal or large, but otherwise healthy. As a large cyst involving the ovary is likely to be duplicated on the other side, he advises the exploratory incision in the second ovary, thereby lessening the chance of recurrence, and saving a secondary operation, often finding and removing by resection a similar growth beginning in the apparently unaffected ovary. He believes the pain would be relieved by a wedge-shaped incision and the wedge removed in thickened capsules; and by a more careful approximation, adhesions, which are stated to be the greatest cause of secondary operations, would be more and more avoided. A number of illustrative cases are reported.

Hysterectomy in Double Pyosalpinx.—Mann³ states that a purulent endometritis has been observed clinically in a very large percentage of the cases of pus-tubes in which he has operated, and he is, therefore, not in favor of leaving the uterus to be the source of suffering and possible after-infection. Many times after removing the pus-tubes the patient has not been symptomatically cured, discharge and pain being frequently observed, and sometimes metrorrhagia, the removal of the uterus having later become necessary. In a small proportion of cases menstruation continues for a time—for years, perhaps—after removal of both tubes and ovaries, but it is rarely normal, being more often the source of various troubles. In such cases hysterectomy does away with the trouble and the necessity for further treatment. The occurrence of cancerous disease of the uterus after removal of the tubes and ovaries is very rare. Still the possibility of such an occurrence in an organ rendered functionally incompetent ought to be enough to favor its

¹ Brit. Med. Jour., Feb. 13, 1904.

² Boston M. and S. Jour., June 30, 1904.

³ Am. Gyn., July, 1903.

removal. Perhaps the strongest argument for its removal is in cases in which the infection is still acute. If the uterus is extensively involved in inflammation, and is left in a ragged and disorganized condition after the adhesions are broken up and the appendages are removed, or if it is greatly enlarged, its removal seems to be a matter of course, since it is likely, under those circumstances, to make more trouble than would possibly be caused by its removal. French operators remove the uterus as a matter of routine. One of the arguments against the removal of the uterus is that the sexual life of the woman is destroyed. Sexual life, however, is dependent only upon the presence of the ovaries, which are the dominating factors in sexual matters. It is always best to preserve them, when possible, in a woman under 40. Mann sees no extra risk to the patient in the removal of the uterus, but, on the contrary, thinks he gets much better drainage, adding to the security of the operation. Vaginal atrophy, which sometimes follows panhysterectomy, is not due to removal of the uterus, but to the establishment of the menopause by the removal of the ovaries. Mann has never seen anything approaching hernia or prolapse of the pelvic contents, due to the removal of the uterus, except in some cases of procidentia.

Ruptured Ovarian Cyst and Sarcoma.—R. Alcock¹ reports a case of multilocular cystadenoma of the left ovary in a woman of 34. Operation was not performed until one week after rupture of the cyst had occurred. The cyst contained no evidence of malignancy, and the right ovary was normal. Improvement of the patient was marked for a time, but general decline then began, and death occurred 9 months after the operation. Autopsy showed the entire abdominal cavity to be occupied by a white, friable tumor-mass; there was also a tumor of the right ovary, the size of an orange, that could barely be differentiated from the former. The whole mass was a round-cell sarcoma. Alcock believes there was a causal relation between the contents of the cyst that escaped into the abdominal cavity and the sarcoma of the contained structures. There is a possibility that the tumor of the right ovary was independent of the general tumor-mass in which it was embedded, and that the latter was secondary to it. The general distribution was against this view, and Alcock considers it very important that no cystic fluid be allowed to escape into the peritoneal cavity during operation on ovarian cysts.

The Malignancy of Certain Apparently Benign Ovarian Cysts.—F. E. Taylor² mentions the frequency of malignant diseases in patients after ovarian operation, and suggests that many ovarian growths are malignant when such nature is not suspected. He describes 2 tumors that to the naked eye were benign, but which, on microscopic examination proved to be carcinoma and sarcoma. From a study of these and other cases Taylor deduces the following points: 1. Macroscopic examination will not distinguish between benign and malignant ovarian cysts, and every one should be submitted to microscopic study to determine its precise nature and give accuracy and precision to both diagnosis and

¹ Practitioner, Apr., 1904.

² Practitioner, May, 1904.

prognosis. 2. Every ovarian cyst should be submitted to operation and removed with the least possible delay after its discovery. 3. Such cysts should invariably be removed entire, without being tapped or punctured, the abdominal incision being made long enough for this purpose, to avoid the risk of sowing malignant cells over the peritoneum. 4. The pedicle should be ligated and cut through as near the uterus, or as far from the diseased tissues, as possible. Nothing in the shape of conservative surgery is permissible in dealing with ovarian cysts.

Recurrence of Ovarian Cysts.—J. D. Malcolm¹ reports 4 cases in which a cystic ovarian tumor which was not malignant developed after a similar growth of the ovary on the same side had been removed. In these cases the tumors removed were, in fact, cystic growths of some portions of ovarian tissue, which were left behind at the first operation. The newgrowth in all the cases developed in the broad ligaments where the ovarian tissue would be, if any were left at a previous operation. Two cases illustrate a somewhat rare point—that an innocent growth developing in the neighborhood of the uterus after menopause may bring about discharges of the blood from the endometrium, just as ovarian tumors growing before the menopause may induce a very free menstruation, leading to an erroneous diagnosis of uterine fibroma.

Ovarian Cyst in a Girl of 10 Years.—A. Xarczewski² reports a case. When the abdomen was opened, an ovarian cyst with torsion of the pedicle was found. Ovarian cysts in children are not rare, the majority being dermoid, like the one reported, which contained hair and a tooth. This cyst doubtless existed from birth.

Dermoid Cyst of Both Ovaries.—C. F. Adams³ reports a case which occurred in a young woman of 26. Operation showed the left ovary to be as large as a horse-chestnut, and the right considerably larger. The left contained sebaceous material and teeth, some of them almost perfectly formed; the right contained sebaceous material and hair.

Cancerous Metamorphosis of Dermoid Cysts.—T. W. Zeleuski⁴ reviews the present state of knowledge regarding cancer originating in ovarian dermoid cysts. He sums up thus: 1. Ovarian dermoids, if they become cancerous, invariably produce the flat epithelial type, which arises from the dermal covering of the cyst. 2. Cancer attacks most frequently multilocular dermoids of the ovary, and is usually unilateral. So far no bilateral cancerous degeneration of ovarian dermoids has been recorded. 3. The victims are generally advanced in years, and the cancer takes a very malignant course, ending fatally either from perforations of adjacent organs or from cachexia. 4. Ascites seems to be invariably absent in this variety of cancer. 5. The diagnosis is difficult, and the only rational treatment is preventive, aiming at removal of dermoid cysts, whenever such are recognized, before malignant changes have supervened.

Appendicitis with Ovarian Disease.—H. C. Coe⁵ emphasizes the

¹ *Lancet*, Oct. 31, 1903.

² *Post-Graduate*, Jan., 1904.

³ *Zent. f. Gynak.*, Apr. 30, 1904.

⁴ *Roussky Vrach*, Nov. 15, 1903.

⁵ *N. Y. Med. Jour.*, Aug. 6, 1904.

following points: 1. Appendicitis is a frequent complication of inflammatory disease of the adnexa. 2. In most cases it is secondary to adnexal trouble, a long appendix in contact with, or adherent to, the right tube or ovary being infected by extension through its walls or through the lymphatics. 3. The inflammation of the appendix is usually of the subacute type. 4. In a small proportion of cases the infection extends from the appendix to an adherent tube or ovary or cystoma. 5. The symptoms of the associated condition are usually determined by the more prominent lesion, but these are referable principally to the diseased adnexa. 6. The diagnosis is made from the history, the location of the pain (above, as well as below the pelvic brim), and the presence of an induration, which can be traced from the appendicular region downward into the pelvis. 7. In acute cases with an intrapelvic mass the lateral incision is preferable, with subsequent exploration of the pelvis and vaginal drainage if possible. If the abscess is mainly and easily accessible, vaginal section is indicated. 8. In subacute and recurrent cases a median incision should be selected. 9. The appendix should be removed whenever the abdomen is opened for pelvic disease, with the exceptions noted.

MENSTRUATION AND ITS DISORDERS.

Menstrual Psychoses.—Several varieties of psychic disturbance attending menstruation are noted by Krafft-Ebing¹: (1) Manifestations accompanying the inauguration of menstruation. There may be a number of attacks—even 10 or 12, all disturbances of the melancholic or maniacal type, disappearing usually with the regular establishment of the menses. (2) In neurotic individuals, usually as the result of shock, psychoses are noted attending ovulation. These are likely to recur each month, even in case of amenorrhea: they appear as a transient or severe mental confusion that ceases during pregnancy and after the menopause. In most cases a hereditary tendency may be noticed, the attack simulating melancholia or violent mania and lasting from 5 days to a fortnight; sometimes suicidal impulses exist. Unless mental depression exists, the prognosis is usually good. The treatment recommended comprises sedatives, hypnotics, baths, ice-packs, with regulation of mental and physical habits in the interval. As a last resort, castration may be considered. (3) Coincident with the menstrual wave and appearing in the form of premenstrual attacks of melancholia—attacks of actual insanity, increasing in severity with the height of the wave, change to depression and melancholia with its subsidence—is the type which Krafft-Ebing styles cyclic menstrual psychoses. This type is of considerable importance in a medicolegal sense, since it may lead to criminal acts, such as theft, arson, and even murder, having their rise in a violent feeling against social institutions. In the case of female criminals careful attention must be given to these manifestations, inquiry being made as to whether the crime was committed

¹ *Zent. f. Gynäk.*, 1903, No. 8.

at the time of menstruation and whether the woman was subject to mental depression at that time.

Early Menstruation.—One of the earliest recorded instances is given by C. Wischmann.¹ The child was but 18 months of age at the time of his first reporting the case, and he had noted 12 distinct menstrual periods occurring during 16 months, each lasting from 5 to 10 days. The child was neither rachitic nor hydrocephalic; the breasts were large, and the mons veneris well covered with hair.

Salpingitis.—McNamara² strongly favors colpotomy and conservative treatment in general. He agrees strongly with Treub's treatment as follows: Medical treatment suffices in at least one-half of the cases of salpingoophoritis. Medical treatment being insufficient or contra-indicated, one should never at the outset perform a radical operation of any sort. The first operative stage should always be posterior colpotomy. Treub,³ in discussing the condition, deprecates hasty resort to radical operation, since diseases of the adnexa rarely result fatally. He says that in 612 cases of salpingoophoritis a more or less complete cure was obtained in 80 % by nonsurgical treatment—rest, ice-bags, hot douches, and tampons. The mortality after radical operations is from 5 % to 6 %, and patients are not always relieved of pain, aside from the fact of subsequent climacteric disturbances. Treub performs posterior section when possible, and when the abdomen is opened, always tries to preserve portions of tubes and ovaries, except in cases of tuberculosis, when he extirpates the uterus with the adnexa.

Should the Uterus and Ovaries be Removed in Operation for Double Pyosalpinx?—C. C. Frederick⁴ thinks that a woman who has a pair of pus-tubes is an invalid, and that in such cases both tubes should be completely removed—that it is unsurgical to leave any part of a diseased tube. With both tubes removed the woman is sterile, but so she was before the operation. The rule should be to save as much healthy ovarian tissue as possible. In some rare instances the uterus should be taken out also—for instance, if the condition is tuberculous, the uterus should certainly be extirpated. But even if both tubes and the uterus are taken, leave the ovaries in whole or in part, if possible; but in double pyosalpinx remove the tubes *in toto*.

Tuberculous Disease of the Fallopian Tubes.—A. W. Lea⁵ reports 4 cases of this kind treated by operation. The operative treatment, which consists essentially of the removal of both tubes, holds out a prospect of cure if the tubes are the primary seat of the disease and removed early; but in acute abdominal tuberculosis and the secondary invasion of the tubes, the value of operative interference is very doubtful.

Tuberculosis of the Tubes.—Ten cases are reported from the Berne Clinic in which the diagnosis was confirmed microscopically, in a paper by Fellenberg.⁶ None of the patients had borne children, and

¹ Norsk. Mag. f. Laegevidensk., Oct., 1903.

² Ann. de gyn. et d'obstet., 1903, No. 5.

³ Brit. Med. Jour., Oct. 17, 1903.

⁴ Brooklyn Med. Jour., Jan. 6, 1904.

⁵ Am. Jour. of Obstet., Nov., 1903.

⁶ Zent. f. Gynak., 1904, No. 5.

in none was there any characteristic symptom; no ulcers were present in the vagina or cervix; the uterus was free from disease in every instance; the peritoneum was affected in 2 cases and the ovary in only 1. Fellenberg regards the prognosis as generally favorable after the performance of salpingectomy, differing from those who advocate extirpation of the uterus and adnexa in all these cases.

Pelvic Abscess.—P. D. Bourland¹ states that pelvic abscess from cellulitis without pus-tube is rare, and even including the latter, is rarer in towns and country districts than in cities. He reports a case after childbirth in which all the refinements of prophylaxis were used. Latent infection from a previous abscess is improbable, as 5½ years of entire freedom from pelvic disease had elapsed. There was no endometritis; the lochia were normal. The extreme toxemia and shock following operation suggest the advantage of opening with carbolic acid or the actual cautery immediately. Richard F. Wood² reports a case of **subuterine abscess**. He reviews the literature of this somewhat rare condition fully and advises the following treatment: Make an elliptic incision, removing the vaginal portion of the sac; the cavity should then be cleaned thoroughly and the edges drawn together with silk sutures. A small drain may be introduced. The bladder should be emptied by a catheter for 6 or 7 days.

Ovariectomy During Pregnancy.—Karl Heil³ adds 66 cases of ovariectomy to the 175 given by Orgler and Graafe. In the collected cases a mortality of 2.1 % shows that the prognosis in ovariectomy is not unfavorably influenced by the contemporaneous pregnancy. The pregnancy was interrupted in about 20 % of the cases. Heil concludes that each pregnant woman upon complaint of pain in the uterus, or unusual or irregular pain in other parts of the genital sphere, should undergo a genital examination. The diagnosis oscillates between extrauterine pregnancy, on the one hand, and intrauterine pregnancy with an ovarian tumor, on the other hand, and celiotomy is absolutely indicated. When possible, the tube should be left upon the side operated upon, in order to avoid rupture or tear of the uterus, and for like reasons he prefers the abdominal route. In his experience the abdominal scar has suffered no injury from the pregnancy or labor. Essen Müller⁴ reports a case in which bilateral ovariectomy was performed because of cystic degeneration. At the time of the operation the uterus was found enlarged. The patient made a good recovery. Upon examination of the right ovary a corpus luteum graviditatis was found, and the patient was informed that she was pregnant; 269 days after the operation the child was born.

Pathologic Histology of Chronic Oöphoritis.—Printo⁵ groups this condition into cortical and diffuse; the inflammation in the former arises as a result of contiguous conditions, while in the latter the pathologic agent is brought to the seat of the trouble, either by means of the

¹ Jour. Am. Med. Assoc., July 23, 1904.

² Amer. Med., Feb. 13, 1904.

³ Münch. med. Woch., Jan. 19, 1904.

⁴ Zent. f. Gynäk., 1904, No. 28.

⁵ Zent. f. Gynäk., 1904, No. 23.

lymph- or blood-stream. In the cortical form he finds the tunica albuginea thickened; the stroma of the cortex evinces a cellular infiltration, especially about the vessels; in cases of long duration the stroma in a few places only shows spindle-cells; the greater portion is poor in cellular elements. Only here and there can unchanged follicles be found. In most of the follicles the cells evince chromolysis, atrophy, and degeneration of the nuclei and of the protoplasm. In the diffuse form the follicles are diminished in number and present cystic degeneration. As etiologic factors, Pinto says the infectious processes are most important, especially gonorrhea and puerperal infection. Then disturbances of the menses, chlorosis, and tumors of the pelvic organs are also influential.

The Chorioectodermal Epithelioma.—L. Pick,¹ after a thorough study of the structure of these peculiar growths, reaches the conclusion that there are developed, especially in very young individuals, in the ovaries and testicles, solid cancer-like or solid cystic benign tumors of complicated structure—epithelioma and chorioectodermal cystic epithelioma. The connection of these neoplasms with their congenital teratomatous origin is shown: (1) Through the usual condition of the characteristic syncytium in the tissue of the tumor. (2) Through the general connection of the tissue with the teratoma. (3) Through the direct continuity of tumor-cells with other ectodermal cell forms. In these 3 facts, added to other morphologic and biologic differences, lies the complete morphologic and biologic distinction of the chorioectodermal epithelioma as distinguished from the ordinary chorioepithelioma or deciduoma malignum of Marchand. This chorioectodermal epithelioma of testicles and ovaries belongs to the category of benign forms of tumors of congenital origin.

Intraabdominal Rupture of Ovarian Cysts.—E. B. Young² reports a case seen in the Boston City Hospital, occurring in an unmarried woman, aged 42. The abdomen was distended by a hard, symmetric tumor rising from the pelvis and extending to the umbilicus. Her poor physical condition delayed operation, and on the fifth day vomiting began, pulse was poor, and collapse supervened. She complained of abdominal discomfort and showed signs of free abdominal fluid, with a diminution in the size of the cyst. She died the next morning, and at the autopsy a great quantity of yellowish fluid containing leukocytes flowed out. The omentum was firmly adherent to the abdominal wall and to the intestines. The lower half of the abdomen was filled with a multilocular tumor with many adhesions. The etiologic factors in rupture may be predisposing causes, such as thin friable walls, rapid rise of internal pressure, and formation of firm adhesions, changes in cyst-walls which occur especially in papillary cystomas, and trauma, either internal or external. The symptoms of rupture are a sensation of something giving way and the outpouring of fluid into the abdomen, pain, tenderness of the abdomen, collapse, nausea and vomiting, fever, disappearance of tumor, change in form of the abdomen, free fluid in the abdomen, palpation of the remains of the tumor, increased urinary

¹ Berl. klin. Woch., Feb. 15 and 22, 1904. ² Boston M. and S. Jour., Mar. 3, 1904.

secretion, tendency to sweat, loss of friction of tumor upon abdominal wall, and presence of peptones in the urine. As to treatment, Young considers operation indicated in every case in which surroundings will permit.

The Relation of the Fallopian Tubes to Menstruation.—J. Riddle Goffe¹ says that the dominant factors in menstruation, in his opinion, are the ovary and its function of ovulation. Menstruation is a retrograde process, the result of the failure of fertilization of the ovum, the tubal mucous membrane and the endometrium participating in the process. He cites 2 cases to prove participation of the tubal mucous membrane. Moltzer² describes the anatomic appearance of fallopian tubes removed from a young girl on the second day of normal menstruation. Fresh blood was observed at the fimbriated ends. In serial sections edema, hyperemia, and hemorrhagic infiltration were noted. Leukocytes were present in the subepithelial tissue and between the epithelial cells, some of which were exfoliated. Bland³ also reports an interesting case. The patient had begun to menstruate at the age of 14 years, and that function had always been normal. She was married at the age of 21 years and had never been pregnant. In April, 1902, she was operated on for an intrapelvic (probably a broad ligament) abscess. An enormous quantity of pus was evacuated and a gauze drain inserted. Healing progressed favorably, but just before the patient left the hospital a small sinus appeared at the lower extremity of the incision. This remained open for 10 months, discharging practically nothing until the day preceding each menstrual period, when a colored fluid would appear, this finally becoming bloody and presenting all the characteristics of menstrual fluid. With the cessation of menstruation the sinus would remain quiescent until the succeeding period. Operation showed that the fimbriated extremity of the rigid fallopian tube was adherent to the abdominal scar. The case brings up the question of the relation of the fallopian tubes to menstruation. Bland has been able to find but 4 authentic cases similar to his own, but from a study of the 5 he reaches the conclusion that the tubal mucous membrane seems to be an active participant in the physiologic process of menstruation.

Amenorrhea and Eye Disease.—Blondel and Sendral⁴ describes an instance of grave ocular complications associated with amenorrhea in a mature woman, and relieved by emmenagog treatment.

Influence of Gynecologic Operations upon Menstruation.—Josef Bondi⁵ made a special study of the influence of *curetment* and of *one-sided ovariectomy* upon menstruation. In the great majority of cases of curetment for menorrhagia, etc., the operation was without any influence upon the type of menstruation, which has been known to return as early as 5 or 6 days after the operation. The mucous membrane, or executive organ of menstruation, may be restored to its normal condition in a very short time, as shown in a case in which the uterus was

¹ Med. Rec., May 7, 1904.

² Zent. f. Gynak., 1903, No. 13.

³ Therap. Gaz., Nov. 15, 1903.

⁴ La Gyn., Feb., 1904.

⁵ Wien. klin. Woch., Jan. 28, 1904.

removed 5 days after the curetment and the mucosa was found completely regenerated. In some rare cases the menses may be delayed for several months, owing to peculiar complications.

The Menstrual Function of the Morphin Habitué.—An editorial in the Boston Medical and Surgical Journal¹ discusses the subject at length. The conclusions reached are that amenorrhea is one of the most constant symptoms of an attack of morphin intoxication, but that the menses usually reappear shortly after a cure of the habit. Amenorrhea does not necessarily mean that there is an absence of the secretion of the ovum; children have been born of females afflicted by the morphin habit and presenting amenorrhea. On the other hand, Leverinstein has seen an absolute atrophy of the entire female genital system in a case of morphinomania. The practitioner is warned that the morphin habit frequently begins from the indiscriminate use of the drug in certain painful affections of the uterus or adnexa. The physiologic action of morphin is a selective one upon the glandular structures, especially the ovary. There results an inhibitory action, preventing the graafian follicles from maturing and reflexly producing a congestion of the uterus and ovaries, from which a suppression of ovulation and menstruation results. After a time permanent lesions take place and the pelvic organs undergo atrophy and loss of function. The reappearance of the menses is a favorable prognostic element so far as the cure of the habit is concerned. It is of the greatest importance to note the regularity and progress of the menses, since they indicate that a cure is being effected.

Dysmenorrhea.—Bedford Fenwick² contends that dysmenorrhea due to **stenosis of the cervix** or to a **conic cervix** can be permanently cured only by incision of the cervix and the separation of the edges of the wound until healing is complete. He has performed this operation in 87 cases, and in 91 % the relief from pain has been permanent. Out of 41 cases of sterility he has heard from 24, in 18 of whom pregnancy has resulted after an average sterility of 5½ years. Schultz³ speaks against the tendency to look upon dysmenorrhea in girls and nulliparous women as a **functional or neurotic disturbance**. It should not be forgotten that the affection may be due to structural changes of the mesometrium, such as insufficiently organized connective tissue in the external uterine layers. Frequently a radical spontaneous cure of dysmenorrhea takes place after the first pregnancy.

Weight Wave of Menstruation.—According to Belfield,⁴ a progressive increase of from 2½ to 5 pounds, occurring a few days before menstruation, is noted in the weight of healthy young women. The gain in weight in some cases amounts to so much as 1.5 % to 5 % of the usual weight. When menstruation begins, however, there is a rapid loss of weight, amounting to almost one-half the gain, and then a more gradual loss, extending over several days after menstruation. He attributes the menstrual gain in weight to diminished excretion, especially of water,

¹ Jan. 28, 1904.

² Brit. Gyn. Jour., Feb., 1904.

³ Jour. Akousherstwa, May, 1903; abstr. Amer. Med., Sept. 26, 1903.

⁴ Med. News, Jan. 23 1904.

and says that the rapid loss in weight is due to the rapid excretion of water which occurs in the early part of the menstrual period.

Castration after Hysterectomy on Account of Dysmenorrhea.—

A. Bluhm¹ reports the case of a virgin of 40. Bluhm remarks that this case has taught him to remove the ovaries in case of malignant growths, as the congestive pain of ovulation has the tendency to produce recurrences and to increase the rapidity of their growth.

Premature Menopause.—Siredey² reports 5 cases in women whose ages ranged from 22 to 35 years. Three were in good health; in one menstruation ceased after typhoid fever, though no direct causal relation could be established. One patient subsequently developed diabetes, from which she died. In all menstruation had previously been somewhat scanty, and 3 had been sterile. Climacteric disturbances were slight. The usual anatomic changes, especially atrophy of the cervix, were well marked. Treatment in true cases of premature menopause is useless.

Menstrual Icterus.—L. Metzger³ reports the case of a healthy woman of 45 in whom icterus appeared regularly before or during menstruation, disappearing completely between the periods. The menses were irregular, the patient being at the climacteric. There were no symptoms of gallstones. He believes the icterus was the result of nervous phenomena so common at this period. There is probably a reflex contraction of the biliary passages, which leads to the development of jaundice.

AFFECTIONS OF THE URINARY ORGANS.

Labia Urethræ and Skene's Glands.—Howard Kelly⁴ describes anew 2 well-defined mucous folds at the external orifice of the female urethra, which he terms labia urethræ, having first called the attention of the profession to them in 1895. When the labia are well developed, they lie in close contact from side to side, forming a longitudinal slit, the urethra, as a rule, being completely hidden. Kelly considers their function to be protective, serving to keep the delicate urethral mucosa with its glands from constant exposure to leukorrheal discharges and the bacterial flora of the vaginal outlet. The labia are often absent, especially in old women. Kelly thinks he solved the question as to the physiologic importance of Skene's glands. He considers that their function is partly for the lubrication of the labia urethræ, but mainly sexual. The first contact of the glans penis is with the orifice of the urethra, thus separating its labia and exposing it to any existing infection. The tendency of the act of penetration is to displace the urethra inward until it lies in the plane of the vaginal wall, and the urethral orifice is carried downward and inward also as the male organ enters the vagina. As the urethra is thus displaced, the orifice becomes everted

¹ Monats. f. Geb. u. Gyn., 1904, No. 102.

² Compt. rend. de la Soc. d'obstet. de gyn. et de pæd., Dec., 1903.

³ Zeit. f. klin. Med., Bd. 53, p. 149.

⁴ Amer. Med., vol. vi, pp. 429-431 and 465-468.

and the inner mucous surface applied to the dry dorsum of the penis. The function of Skene's glands then is to exercise an office for the urethral orifice precisely similar to that of the vulvovaginal glands in relation to the vaginal orifice, to provide a lubricating fluid for protecting the delicate mucosa from harmful attrition.

Hypertrophies and Inflammations about the Urinary Meatus.—

Robert L. Dickinson¹ (Brooklyn) says that their frequency and the suffering caused give them an importance out of all proportion to their minute size. They are often overlooked because hidden among the folds of mucous membrane. A tiny ribbon ran from the rear of the vaginal opening forward, on each side of the vaginal and urethral openings, across the vestibule, to disappear beneath the clitoris. This fold was persistent in those cases where the hymen ran forward of the meatus, or the meatus seemed to open on the anterior vaginal wall. This fold was enlarged by friction or traction to produce flaps or labia, hanging out at each side of the meatus. They were found only with corrugated labia. A dilated or dilatable urethra often accompanied them. The urethral glands opened near the apex of the flaps. They were long, running down into the anterior column of the vagina. Swelling from infection differed from hypertrophy. The cure of the chronic inflammation was feasible only by obliteration of the glands. A fine probe passed to the bottom of the glands rendered the vestibular-vaginal surface tense; the cautery wire cut out the probe. For piles of the meatus the cautery wire was used after cocaine; for prolapse or dilation of the urethra, resection of the anterior vaginal wall or paraffin injections into the urethrovaginal septum produced a sigmoid profile.

Gummatous Affection of the Female Urethra.—G. Löwenbach² details 28 cases of this affection, which is unusually chronic and refractory to treatment. A more or less permanent hypertrophy usually results, amounting often to a tumor of considerable size or a condition of elephantiasis. The mucous membrane of the urethra may be involved in the ulcerative process, with resulting strictures. The process may extend to other parts of the genitalia. This gummatous affection is a late manifestation of syphilis, coming on usually about 5 to 7 years after the primary infection.

Surgery of the Female Urethra.—Dr. Ely Van de Warker³ (Syracuse, N. Y.) says that the amount of disturbance caused by a simple irritation of the urethra to the bladder and indirectly to the kidneys affords striking proof of the validity of reflected nervous disturbance. The term sacculation is regarded as better than the old one, urethrocele. Its major cause is mechanic, as inflammation alone is not adequate to its production. Prolapse of the mucous lining of the urethra van de Warker had generally associated with long-standing urinary troubles of various kinds. Bladder incontinence and dribbling were often lifelong conditions. That this was due to a defective action of the sphincter vesicæ was more than doubtful. Dribbling was one of the symptoms

¹ Med. News, June 4, 1904.

² Zeit. f. Heilk., Bd. xxiv, Hefte 1 u. 5.

³ Amer. Med., Aug. 13, 1904.

of hysteria, of which a striking case is given in illustration. The powerful influence of hysteric disturbance over the urinary tract was constantly observed. The urethral stricture, when of small caliber, was frequently found with dysuria and dribbling. Van de Warker referred to but 2 cases of urethral mucous polyp and concluded that they must be rare. Stricture of the urethra is common in women. Any condition that tended to produce linear or annular thickening thus led to stricture. Specific urethritis might produce stricture, but it was not the frequent cause alleged by some writers. Stricture of large caliber might be located and measured by the Otis bulbs, but never by the sound, as was recommended by old systematic writers. Annular stricture of the meatus was the form most commonly met. As to the inversion of the mucous membrane at the meatus, its prototype was the fusiform stricture of Otis. Caruncle of the urethra was a common occurrence.

Bladder Irritation in Girls.—W. D. Spanton,¹ in examining, under the microscope, a fluffy mass passed by a child of 3 years, in whom micturition was painful from a tender urethral orifice, found it to contain woolen fibers entangled in mucus. Several similar cases presented themselves later. In all these the trouble originated in the woolen combination suits, rather rough at the edges, which the little girls wore, some of the fibers from which had wormed their way along the urethra into the bladder by means of their barbed edges. Linen fibers being smooth, this accident cannot occur. With a change in garments and a diuretic for a few days all trouble disappeared.

Bladder Changes Cystoscopically Evident in Uterine Carcinoma.—W. Hirt and R. Sticher² give in detail the result of careful cystoscopic examination of the bladder in patients suffering from uterine carcinoma. They found, in the mucous membrane of the bladder, especially in the trigonum between the internal orifice of the urethra and of the ureters, peculiar accumulations of epithelial cells, some conic, some spheric, and others irregular forms. The writers are of the opinion that the character of these changes in the bladder, as shown by the cystoscope, may determine whether the cancer is operable or inoperable. Several cases are cited to sustain this theory.

Prophylaxis of Postoperative Cystitis in Women.—Rosenstein³ finds that by the use of his double catheter infection of the bladder occurred only once in the 34 cases operated. Many of these were catheterized 21 times before the patients voided urine voluntarily. Baisch⁴ gives as important factors in the etiology of the condition the disturbances of bladder, innervation leading to paralysis of the viscus and interference in the nutrition of the organ on account of extensive dissection. In addition, staphylococcus and colon bacilli present in the urethra are likely to be introduced on the catheter. In consequence he employed irrigation of the bladder after every catheterization, with the best results.

Tuberculosis of the Urinary System in Women.—G. L. Hunner⁵

¹ Med. Press and Circ., Feb. 24, 1904.

² Deut. med. Woch., Nos. 44 and 45.

³ Zent. f. Gynäk., 1904, No. 28.

⁴ Zent. f. Gynäk., 1904, No. 12.

⁵ Johns Hopkins Hosp. Bull., Jan., 1904.

reports 35 cases in the service of Dr. Kelly and his assistants at the Johns Hopkins Hospital. The right kidney was operated upon in 17, the left in 18, instances. The paper deals mainly with the question of diagnosis. Hunner believes that by far the larger number of cases of urinary tuberculosis in women begins in the kidney; he classes only 5 of the 35 cases as primary bladder infection, and says that in the past 6 years he has seen only 2 cases of tuberculosis of the bladder in which other portions of the urinary system were intact. While the ability to do cystoscopic work is of very great help in the diagnosis and treatment of this condition, inability to use that instrument does not excuse the physician from making the diagnosis. Tubercle bacilli should be found in practically every case; do not examine 20 or 30 slides in one day, but 2 or 3 slides daily for a week or more. Hunner severely denounces what he calls the abuse of cystoscopy. This consists principally in catheterizing supposedly healthy kidneys through bladders known to be infected, or a supposedly sound organ when the opposite one is diseased. He is skeptical regarding the topical treatment of bladder tuberculosis; he has never seen a patient recover without operation. Hunner¹ also reviews the **present status of surgical technic** and gives a review of the results of surgery with reference to wound healing, cure of the local disease, and effect on the general health of the patients in these 35 cases. The majority of the patients were under 30 years of age, and almost all the cases occurred in white women. As to treatment, he is of the opinion that if the disease is one-sided, operation without delay is indicated; if previous cryoscopy has shown renal sufficiency and a wide difference in the two kidneys, the poorer kidney should be removed if it is the seat of predominating symptoms; if a portion of the poorer kidney is found in a condition of apparent health, partial resection must be considered. A partial resection is the operation of choice in the rarer cases of double kidney with double pelvis and ureter in which but one segment of the kidney and one ureter show disease. Among the operations performed in these 35 cases Hunner details nephrotomy, nephrectomy, and partial ureterectomy, nephroureterectomy, and nephroureterocystectomy. He is not in favor of the partial section of the bladder at the primary operation, except in rare instances, but he does not agree with Motz, who thinks there is a tendency to spontaneous healing in tuberculosis of the bladder. In excising tuberculous areas in the bladder both mucosa and muscle should be included, and if there is a suspicion that some of the disease remains, or if it is necessary to open into the peritoneum, a vesicovaginal fistula should be made. This places the bladder at physiologic rest as long as may be deemed necessary. It makes the bladder suture safe, and prevents infection and pressure ulcers that may occur with a retention catheter in the urethra. A small strip of iodoform gauze should lead from the bladder into the vagina for the first 48 hours, to prevent the fistula from closing. The fistula may easily be closed under the local cocaine anesthesia when its purposes have been served. If future experience should demonstrate

¹ Amer. Med., Apr. 30, 1904.

the desirability of removing a portion of the bladder with the ureter, this operation in multiparas and women with large vaginas will probably be performed through the vagina. After freeing the ureter down to the uterine vessels, a finger beneath the end of the ureter makes a safe guide for puncture through the vaginal wall with sharp scissors. The ureter is dragged down through this puncture opening, and the vaginal wound is enlarged according to the area of bladder to be resected. After resection of the diseased area the deeper portion of the bladder and vaginal wounds may be closed, leaving the portion nearest the internal urethral orifice open for the purpose of a vesicovaginal fistula. In certain cases benefit may be obtained from biweekly or weekly instillations of mercuric chlorid solution, 1:10,000 to 1:5000. In all kidney operations the operation of infusion of salt-solution is supplemented by enemas of salt-solution given every 4 to 6 hours for the first day or two. Analysis of the results gives 25 out of the 35 cases, or 70 %, to be classified either fairly good or excellent health. The article concludes with the following summary: Tuberculosis of the urinary system is a surgical disease, being, as a rule, unilateral, and often the only focus of tuberculosis in the body. If the disease is bilateral and there are no pronounced symptoms referable to the kidneys, the treatment should be that usually accorded tuberculosis of the lungs, viz., suitable climate, nutritious diet, and proper regulation of the patient's rest and exercise; but if one or both sides begin to cause marked local or general manifestations, surgical intervention is often of great benefit. In case of bilateral disease or in associated disease of the lung the anesthetic is of great importance. Local cocain anesthesia may be used for nephrotomy, and nitrous oxid gas for nephrotomy, nephrectomy, or nephroureterectomy. Thickened ureters are generally tuberculous, and should be removed with the kidney if the patient's condition justifies. Bladder disease in these cases is often nontuberculous, and removal of the diseased area should not be attempted at the first operation. If the bladder fails to heal within a year under ordinary methods of cystitis treatment, the disease is probably tuberculous, and if not occupying more than half of the bladder, it should be excised.

Ascending Renal Infection.—J. A. Sampson¹ speaks of ascending renal infection with special reference to the reflux of urine from the bladder into the ureters as an etiologic factor in its causation and maintenance. This question was made prominent by the death of several patients from ascending renal infection, subsequent to resection of the ureters in radical operations for cancer of the cervix. The anatomy and physiology of the ureters and bladder and the etiologic factors in cystitis and ascending renal infection have been studied in man and in dogs by Sampson, and, in part, the following conclusions have been reached: Under normal conditions it is impossible for fluid to pass from the bladder into the ureters; organisms may be conveyed from the bladder to the kidney through the following channels: (1) The general circulation; (2) the vesicouteroovariorenal anastomosis; (3)

¹ Johns Hopkins Hosp. Bull., Dec., 1903.

the bloodvessels of the ureter; (4) the lymphatics; (5) the lumen of the ureter.

The Bladder in Ventral Suspension.—Swithin Chandler¹ reports the operation and bladder examination in 20 cases requiring the operation of ventral suspension, and offers the following deductions: 1. In all cases requiring ventral suspension the bladder should be thoroughly examined by a cystoscope. 2. In no case reported among this number was there any trouble with frequent micturition after the operation of ventral suspension, except when there was some evidence found which would cause such disturbances. 3. The new position of the bladder after ventral suspension aided and relieved, rather than caused, frequent micturition. 4. The operation may have caused this relief by removing pressure from the neck of the bladder, which pressure undoubtedly helps to cause frequent micturition.

Catheterization.—M. Krotoszyner and W. P. Willard² conclude: (1) Soft-rubber catheters are rendered sterile by being boiled 5 minutes, preferably in sodium chlorid solution; (2) hard-rubber and silk and cotton woven catheters should be boiled 5 minutes in a saturated solution of ammonium sulfate; (3) ureter-catheters may be folded and wrapped in a towel so that their surfaces are kept apart, and boiled for 5 minutes in a saturated solution of ammonium sulfate; (4) cystoscopes should be sterilized by first washing in soap-spirits and water, then vigorously rubbing for 2 minutes with 2 different pieces of gauze or cotton, wet with soap-spirits, and then with alcohol for 1 minute. Gusseff³ utilizes a nickel tube 12 mm. ($\frac{1}{2}$ in.) in diameter and 21 cm. (8.4 in.) in length. The catheters are placed into the tubes and then the opening of each tube is closed with a piece of cotton; after this is done the tubes with the contained catheters are placed in the autoclave and sterilized under pressure, or they may be sterilized by means of dry heat. When sterile, the tubes with their contents are put away until wanted. In this way 10 or 12 sterile catheters may be kept on hand.

Spontaneous Healing of a Vesicocervical Fistula.—Gallatin⁴ reports the case of a woman who had given birth to 7 children. Subsequent examination of the patient proved the existence of a cervico-vesical fistula which allowed the urine to pass out through the vagina. Severe hemorrhage prevented the suturing of the fistula at the time, and Gallatin had to be satisfied with an injection of ergotin, followed by daily irrigation with boric-acid solution. In about 10 days the patient emptied the bladder normally, showing the spontaneous healing of the fistula.

Vaginal Cystotomy for Stone in the Bladder.—C. R. Robbins⁵ reports 2 cases and concludes that cystotomy is the operation of choice for stone in the bladder, and vaginal cystotomy is the ideal operation in most cases. It is easily and quickly executed, and if necessary, can be done under cocain anesthesia. It gives the best drainage if cystitis is

¹ N. Y. Med. Jour., May 28, 1904.

² Med. News, Aug. 27, 1904.

³ Zent. f. Gynäk., 1904, No. 29.

⁴ Zent. f. Gynäk., Oct. 17, 1903.

⁵ Am. Gyn., Dec., 1903.

present. The only objection that can be urged is the danger of forming a vesicovaginal fistula. He believes that if we refrain from sewing the mucous membrane of the bladder and vagina together and rely instead on a daily opening of the incision, we will seldom encounter this complication.

Resection of the Ureters and the Vesical Wall in Cancer Extending to the Matrix.—A. Depage and L. Mayer¹ review the literature and describe the technic of ureterocystostomy. They conclude that in all cases of cancer extending to the uterus it is advisable to resect the ureters and a portion of the bladder adherent to the matrix.

Simultaneous Catheterization of Both Ureters.—Elsner² describes a new instrument for this purpose and recites its advantages (Fig. 45). The catheters (A) are put in the small tubers (B) of the cystoscope (C),

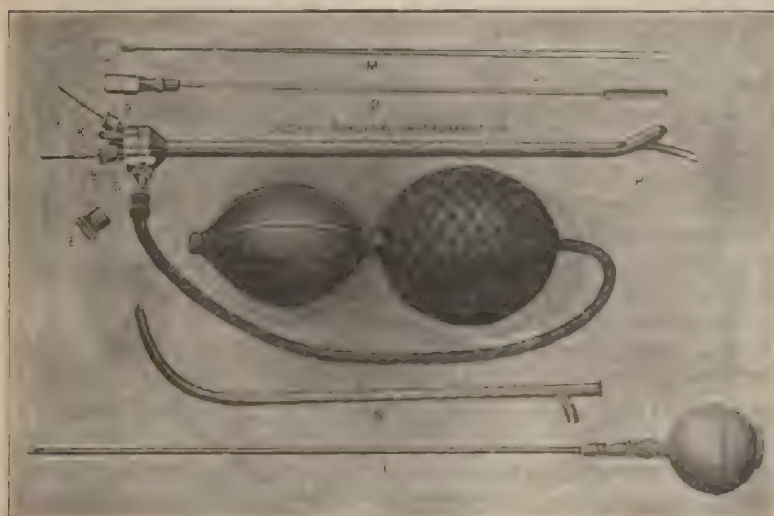


Fig. 45.—Elsner's ureterocystoscope.

the obturator (D) placed in position, and with the beak well oiled the scope is introduced into the bladder. As soon as the bladder is entered the obturator is withdrawn and the window (E) inserted. The tip of the insufflator (F) is attached to the stop-cock (G). The current is now turned on, resulting in a cold light at (H). You now inflate the bladder with air. It is well to use very little air at a time, for with each attempt at inflation you get a rapid, clear view of the field, quite enough to give you your bearings. If urine accumulates about the field, it can be withdrawn by removing the window and inserting the long tube evacuator (I).

Removal of Ureteral Calculus by the Vagina.—Gradenwitz³ reports the following case: The patient, aged 43, had suffered for 3

¹ Jour. méd. de Brux., May, 1904, p. 245. ² Ann. of Gyn. and Ped., Aug., 1903.

³ Zent. f. Gynak., 1904, No. 12.

years with colicky pains, beginning in the right kidney and radiating over the left. She had passed 2 phosphatic calculi. On vaginal examination a small stone was felt in the bladder, which was easily removed by the urethra after moderate dilation. Four weeks later the patient reentered the hospital on account of the return of the colicky pains. It was now possible to palpate a stone, the size of a cherry-pit, impacted near the left ureteral orifice. Cystoscopic examination was negative, and the daily excretion of urine was about 2 pints. Three months later only half this quantity was excreted, and the catheterization of the left ureter showed that no urine escaped from the kidney, though the fact of hydronephrosis could not be established.

Preservation of the Periureteral Arterial Plexus.—J. A. Sampson¹ describes at length the blood-supply of the ureter, which he has investigated in numerous human and animal subjects. The main trunks of the plexus run in a longitudinal direction from the kidney to the bladder in the outer loose perimuscular fibrous coats of the ureter; from these arise smaller branches, forming the meshwork of the plexus. It is possible to inject the entire plexus from the renal or internal iliac artery, and also probably from any vessel that furnishes a ureteral artery. The practical point is dissected free for considerable portions of its length without danger of necrosis if the plexus is allowed to remain intact. Sampson discusses this point with special reference to carcinoma of the cervix. If, when hysterectomy is performed, the parametrium is removed mesial to the ureter, necrosis of the latter structure is slight, but cancer may be left; if the ureter be dissected free and the surrounding tissues are removed, danger of necrosis is greater, but that of recurrence of the growth is less. In either case the periureteral plexus and also the ureteral sheath should be preserved. This is best done by resecting the lower portion of the ureters and implanting the renal ends into the bladder; this is the only operation justifiable when the ureteral sheath is involved.

Plastic Operation for Hydronephrosis.—Petersen² describes an ingenious operation for the relief of obstruction to the ureter following incision and drainage of a hydronephrotic kidney. The obstruction proved to be a valvular fold of the mucous membrane at the entrance of the ureter. This was removed by making a longitudinal incision, as in pyloroplasty, and closing it transversely with catgut sutures. The renal sac was then folded on itself at several points and the folds were sutured, so as to reduce the size of the pelvis as much as possible. The drainage of the urine through the wound rapidly diminished, and at the end of 6 weeks the patient was discharged cured.

Pelvic Tumors and Misplaced Kidneys.—An editorial in the *British Medical Journal*³ says that the possibility of abnormally placed kidneys must be borne in mind both by physicians and by surgeons who have to deal with abdominal pelvic tumors. There seems to be some relation between retroperitoneal growths and kidneys placed in the pelvis, or at

¹ Johns Hopkins Hosp. Bull., Feb., 1904. ² Münch. med. Woch., 1903, No. 11.

³ Sept. 19, 1903.

least on the pelvic brim. Billroth discovered a misplacement of this kind in operating on a fibromyoma of the broad ligament, and Doran had a similar experience when removing a large retroperitoneal lipoma. There was no difficulty in detecting the precise nature of the malformation in either of these cases—that is to say, not only was the kidney displaced, but its vessels clearly arose from the iliaes. A recent discussion before the Gynecological Society of Munich shows that a misplaced kidney, lying in the pelvis, may lead to errors of diagnosis, while it is not always clear whether it is a floating kidney, dragging down renal vessels of normal connections or a kidney supplied by vessels in the pelvis. Otto Seitz exhibited a cystic kidney which extended deeply into the pelvis and bore other characters suggesting that it was an ovarian cyst. It proved to be renal, and on the posterior layer of parietal peritoneum being divided it was removed by enucleation. Stumpf, in discussing this case, expressed the belief that it was a true pelvic kidney; it was on the left side, as is usual in this anomaly. Ludwig Seitz had observed a right pelvic kidney in a stillborn child. Amann related a case of great importance as to the clinical aspect of the question. An enlarged kidney which extended into the pelvic cavity was found closely adherent to a pyosalpinx. It could not be decided (presumably at an operation) whether this was a case of floating or of true pelvic kidney. Stumpf remarked that as far as diagnosis could guide us, nothing further was certain than that a tumor of this kind lay behind the intestines. More light is needed on the question of true pelvic kidney, and the demonstrators of pathology in medical schools have ample opportunities for making researches which might greatly increase knowledge of a subject of undoubted interest and of no mean importance in these days of abdominopelvic surgery.

GENERAL PELVIC CONDITIONS.

Tumors of the Round Ligament.—D. G. Lewis¹ says that little is known of the etiology of these growths. Menstruation provokes a temporary increase in the volume of the neoplasm. Some of the tumors are situated directly over the external orifice of the external inguinal canal; others at the upper extremity of the labium majus; while some are found where one finds no trace of normal round ligament tissue—*e. g.*, about and below the labium majus. In rare cases the tumors are elongated, cylindric, taking the form of the little finger. Usually they are single, though they may be multiple.

James Swain² reports 50 consecutive intraabdominal operations on the ovaries, tubes, and broad ligament.

Appendicitis in Relation to Pelvic Inflammation.—J. M. Baldy³ does not agree with surgeons who remove the appendix as a routine practice for prophylaxis, although he appreciates their reasons. He is, however, unable to follow the reasoning of that class who adopted the

¹ Am. Jour. of Obstet., Aug., 1903.

² Brit. Med. Jour., Feb. 13, 1904.

³ Amer. Med., Apr. 16, 1904.

practice of removal on the ground that the condition of adhesion implied appendicitis or future danger of the disease. Of the mixed class in origin 95 % were cases of pelvic inflammatory disease, and the adhesion of the vermiform appendix was a mere coincidence due to inflammation of contiguous serous surfaces, as was so commonly the case of adhesions of the intestines in pelvic inflammatory diseases. His experience has led him to differ from those writers who hold that appendicitis generated pelvic inflammatory disease, or that pelvic inflammations cause appendicitis. The two diseases were rarely associated, and then only as a coincidence. He is firmly of the opinion that the one never causes the other. In all his experience he had never seen a single case in which, having found pus in a fallopian tube, pus was present in the involved vermiform appendix; nor has he ever found a perforated or gangrenous appendix in such a case. On the other hand, when he has found a perforated or gangrenous appendix or one which contained pus, he has never noticed pus in a fallopian tube or ovary. Deaver¹ says appendicitis may cause a pelvic abscess in 3 ways: (1) By the extension of a purulent collection from the right iliac fossa to the pelvis. (2) By an appendiceal abscess in the pelvis with the appendix hanging over the iliopectineal line or entirely in the true pelvis. (3) By infection of the tube and ovary, with involvement of both appendix and adnexa in purulent exudate. During 1901, of 238 cases of acute appendicitis in the adult operated upon by Deaver, 34.8 % were women. The error most often made in diagnosis is that between pyosalpinx and appendicitis. This error is the more serious in that appendiceal disease is progressive in character and demands operation during the earliest stages, while a salpingitis, which is usually due to gonorrhea, does not require an early operation because of the limiting nature of the disease. Pelvic abscess due to infection ascending the tubes will present symptoms distinguishing it from appendiceal abscess in most instances. A very interesting phase of appendicitis is when the right tube or ovary may become infected from a diseased appendix in the pelvis. Of the 83 cases of acute appendicitis in the female operated upon by Deaver at the German Hospital, disease of the adnexa was coincident as follows: In one a cystic condition of both tubes and ovaries was present; in another, a double pyosalpinx with an infected appendix; in 3 cases an acutely congested and inflamed appendix was undoubtedly the cause of a right-sided pyosalpinx without any disease of the left side.

Complication of Pregnancy with Appendicitis.—A. Labhardt² reports 2 cases of complication of pregnancy with appendicitis, but of entirely different type. In the first case there was an abortion in the early months of pregnancy and immediately following appendicitis, with formation of an abscess. In the second case the appendicitis followed a normal delivery and there was recovery without operation.

Catarrhal Enteritis and Pelvic Disease.—R. T. Gillmore³ describes cases of catarrhal enteritis in women which closely simulate

¹ Ann. of Gyn. and Ped., Jan., 1904. ² Münch. med. Woch., Feb. 9, 1904.

³ Am. Jour. of Obstet., Dec., 1903.

pelvic disease. These patients are often treated by gynecologists without success, and they are finally labeled as neurasthenics. A neurotic temperament has not appeared to Gillmore to be a predisposing cause. The diagnosis is best made by examination of the stool.

The Treatment of Postoperative Intestinal Paralysis by Physostigmin.—Pankow,¹ in order to determine the relative value of the substance, first observed the results in a series of cases. This series consisted of 119 laparotomies, 63 vaginal cases, and 28 Alexander-Adams operations. The results were favorable.

Relationship of Colon to Abdominal Tumors.—J. F. Baldwin² claims that the position of the colon in relation to an abdominal tumor is often an efficient aid in determining its origin.

General Peritonitis and its Treatment.—J. B. Seldowitch³ presents the contrast between the treatment of peritonitis some 20 years ago and at the present day. Believing that surgical treatment is the method of choice in purulent diffuse peritonitis caused by gynecologic disease, Seldowitch contributes considerable statistical material of his own, showing a percentage of cures equal to 29. Although this does not at first thought seem very encouraging, his remarks make it probable that under medical management the rate of recovery would have been far lower. He pleads for more optimism in this field.

OPERATIONS, TECHNIC, ETC.

A New Operation for Cancer of the Uterus.—M. A. Strauch⁴ recommends a modified radical operation of his own. The surgeon thoroughly scrapes out the cancerous tissues with a sharp spoon, or, if feasible, cuts off the growth with scissors. The resulting excavation or raw surface is then well cauterized with the Paquelin. The vagina is tightly packed with iodoform gauze in order to check the hemorrhage and raise the uterus as high as possible. Thereupon the patient is placed in the Trendelenburg position and the linea alba incised from navel to symphysis. Bleeding vessels are clamped, and the fundus uteri is grasped with strong forceps and lifted high up. The infundibulopelvic and the round ligaments are ligated with strong catgut as far as possible from the uterus, and, besides, clamps are inserted nearer the uterine body in order to prevent bleeding into the peritoneal cavity. With scissors the surgeon now cuts the upper portion of the broad ligament and separates bluntly the two folds. This exposes to view the lateral ligament, showing the ureter in the depth, and just above the ureter is the uterine artery, which is ligated on both sides near its union with the hypogastric artery. The anterior uterine surface is separated from the peritoneum, the bladder and vagina being pushed high upward. The rectouterine ligaments are seized near the pelvic wall with clamps and severed. The peritoneum of the Douglas space is opened and the rectum separated. When all this has been done, the uterus remains connected

¹ Zent. f. Gynak., 1904, No. 31.

² Roussky Vrach, Jan. 17, 1904.

³ Am. Jour. of Obstet., Jan., 1904.

⁴ Am. Gyn., Oct., 1903.

only with the vagina. The latter is now cut off at a good distance from the uterus, and the anterior vaginal wall united with the apex of the bladder, leaving the peritoneum free. The posterior vaginal wall is united to the posterior fold of the peritoneum. The glands at the obturator nerve and at the inner inguinal ring are removed. The peritoneum is also opened along the course of the large vessels and all glands excised. The subperitoneal space is drained and all glands excised. The subperitoneal space is drained from the vagina.

Ventrofixation of the Uterus.—The operation of ventrofixation appears to W. J. Sinclair¹ to be the best for the treatment of chronic retroflexion of the uterus in women at the child-bearing time of life. He condemns the introduction of sutures through the posterior surface of the uterus, as practised by Kelly. That is ventral suspension, not fixation, and is faulty in many respects. In performing ventrofixation he uses only catgut and the finest silk thread. In closing the vesico-uterine fold he introduces only 2 catgut sutures while the uterus is firmly pulled upward. Then fine silk sutures are introduced from the outside surface of the parietal peritoneum, passed through the peritoneum, and after taking a good hold of the uterus low down and near its margin, they are brought back through the peritoneum and firmly tied. The knot is thus always extraperitoneal. Two of such sutures are, as a rule, introduced on each side. The same process is now continued, the sutures including the fascia, as well as the peritoneum on each side. The transverse sutures are next introduced. These are 2 or 3 in number, consist of fine silk, and include fascia and peritoneum at the sides, and each takes a fairly extensive hold of the anterior surface of the uterus. The highest of the sutures is placed about half-way up from the isthmus to the fundus.

A Critical Consideration of Modern Gynecologic Operations.—Fritsch² warns against the tendency of certain gynecologists to use either the abdominal or vaginal route on principle, and advises those who prefer the vaginal route not to exaggerate the dangers of laparotomy. He believes that the man who operates upon myomas on principle by the abdominal route will have fewer disappointments and accidents than the man who always operates through the vagina. He is very emphatic in advocating the abdominal route in all cases of purulent inflammations of the uterine appendages. He prefers laparotomy in the removal of ovarian cysts, even if they are small. He operates through the posterior vaginal fornix in cases of pyosalpinx only when the tumor can be pulled down into the vagina with the uterus. He approves of the vaginal way in cases of ectopic pregnancy only if the fetus is dead and the operation is performed with the idea of removing an old hematocele. In cancer he wants all operative interference limited to early cases, and he believes that for these "good" cases the vaginal panhysterectomy will soon regain its old favor. Two points are of importance in a consideration of all various operations devised for the rectification of malpositions of the uterus: first, the danger involved in the operations and

¹ Brit. Med. Jour., Mar. 20, 1904.

² Zent. f. Gynäk., 1903, No. 49.

their sequels; secondly, the results as far as recurrence is concerned. From this point of view Fritsch arranges the operations as follows: Ventrofixation is the most effective of all operations, and it fits almost every case. The operation of Alexander-Adams is almost free from danger, and in cases of freely movable uteruses just as serviceable as ventrofixation. Vaginofixation and vesicofixation, in his opinion, do not offer any advantages.

Pessaries and Their Dangers.—H. MacNaughton Jones¹ is of the opinion that a very large proportion of retroversions may be cured by the aid of a pessary, and that a less number can be cured of complicating conditions as well. Conditions counterindicating the use of any pessary are displacements associated with endometritis before the latter is cured; displacements complicated by adhesions, adnexal tumors, inflammation of ovaries and tubes, and tumors in Douglas's pouch; and cases in which the displacement recurs when the pessary is removed, and even with it in place. Kouwer² found in 2800 gynecologic cases 239 cases of retroflexion, applying treatment in 210 instances. The uterus was movable in 135 cases; adherent in 175, operation being done in 7. Of the number being treated with tampons, cure was obtained in 25 % of the cases and 31 of the patients were subsequently able to wear pessaries. He used pessaries in 120 cases of movable retroversion; no treatment was necessary in 6, and in 9 patients operated upon cure was reported in 1. Out of the 239 patients, operation was performed in only 16. In movable retroflexion Alexander's operation was used; 9 operations were successful, cases being recorded. Kouwer is entirely opposed to the surgical treatment of retroflexion, since the uterus cannot be restored to its normal position by any surgical method, although this is possible in some cases by the use of the pessary. Young girls should be treated as little as possible. He bases this conclusion upon the fact that in the 5 abdominal operations for adherent retrodisplacement not a single patient was permanently relieved. J. H. Carstens³ enters a plea against the wholesale abandonment of the use of the stem pessary. He says that it has proved of great use in the stimulation of infantile uteruses to development. He takes his patient to the hospital and prepares her as if for any operation, keeping the patient in bed for one or two days after the pessary is introduced; then he allows her to get up and walk around, and in 3 or 4 days she is permitted to leave the hospital and resume her ordinary pursuits. He does not prescribe any after-treatment—not even hot douches. He recommends this plan of treatment in infantile and poorly developed uteruses, amenorrhea, scanty or irregular menstruation, such as occurs in fleshy women, simple cases of retroversion, such as are found in young girls, and in cases of stenosis or tortuous uterine canal. The stem can be worn at least 6 months, and a year or even 2 years is better. The pessary can be easily removed if at any time irritation is produced.

Thrombosis of Femoral Veins Following Septic Laparotomy.—

¹ Med. Press and Circ., Apr. 27, 1904.

² Zent. f. Gynäk., 1903, No. 42.

³ Am. Jour. Obstet., Nov., 1903.

E. R. Secord¹ reports the case of a woman of 35 upon whom he operated for double hernia, one of which had been present 12 years, the other growing within a few weeks. The early convalescence was uneventful, but at the close of the second week pain in the left groin led to the discovery of a hard, tender cord occupying the position of the upper end of the saphenous vein. The condition was an extensive thrombosis involving the saphenous and femoral veins, on the left side, where the smaller operation had been performed, but where a truss had been worn for 12 years.

Leukocytosis in Pelvic Disease.—The results in 2000 blood-counts made in 223 patients are presented by Dutzmann.² He concludes that leukocytosis furnishes an indication in excision, acting as a valuable guide to the presence of pus in pelvic exudates. Diagnosis may be confirmed in doubtful cases of supposed pus by the iodine reaction of the white cells. The surgeon is not only assisted in diagnosis by the leukocytosis count in adnexal disease, but may be guided in his choice of the abdominal or vaginal route in fibromyoma, carcinoma, and intra-uterine pregnancy. Kerschmeier³ noticed marked leukocytosis in all his cases of parametric and perimetric pus. In several instances in which no pus was found the number of leukocytes was doubled after operation, probably because of fresh lymphatic infection. He infers that a leukocytosis of 30,000 points with great probability to the presence of pus, but that a moderate increase in the number of white cells is of little diagnostic value. The fact that there is no increase is no evidence that pus is absent. E. Wahlstein and O. Fellner⁴ give tabulated statements of their investigations in 29 cases, and their experience in inflammatory adnexal tumors leads them to conclude that suppurating adnexal tumors in the acute stage are accompanied with leukocytosis. The leukocytosis persists longer than the fever, but yet it diminishes in spite of the continuance of the pus-sac. Adnexal tumors with no pus-contents show no leukocytosis. The hope that the condition and number of leukocytes would be an index in differential diagnosis between intraperitoneal suppuration and internal hemorrhage proved fallacious, since the leukocytosis in the cases studied furnished no data of distinction between suppuration and hemorrhage, being similar in both conditions. E. S. Carmichael⁵ believes that in 75 % of cases quantitative give as trustworthy results as qualitative examinations. Toward the end of pregnancy and during parturition leukocytes increase, while during the puerperium there is a steady decrease, and if a marked leukocytosis is found, toxemia must be suspected; there is a strange independence of temperature and leukocytosis. Pelvic exudation or abscess may be looked for. In chronic exudations the leukocytosis is lower than in acute forms. Streptococci cause the highest degree, and *Bacillus coli communis* the next, gonococci only a moderate degree, and the tubercle bacillus not any. More than 10,000 in tuberculous conditions

¹ Am. Gyn., Oct., 1903.

² Monats. f. Geb. u. Gyn., Bd. xvii, Heft 1.

³ Wien. klin. Rundschau, 1901, No. 11.

⁴ Wien. klin. Woch., July 9, 1903.

⁵ Scottish Med. and Surg. Jour., Feb., 1904.

indicates a mixed infection. In ovarian tumor much increase in the white cells indicates an inflammatory, rather than malignant, cause. One cannot lay down a hard-and-fast rule as to the number indicating operation, but suppuration should be suspected after 3 counts of 20,000 or above. A rise after operation is a sign of bad drainage. With high leukocytosis and tubal swelling palliative methods, as drainage by the vagina, are indicated. In ulcerative cancer of the cervix the leukocyte counts should be reduced by cauterization before extirpation. In puerperal fever with marked toxemia and no leukocytosis the result is inevitably fatal. Leukocyte decrease with eclampsia is grave; increase is favorable. The qualitative count in a few cases gives more information than the quantitative, but it also often fails. The count should be made when digestive leukocytosis is absent, and also that from drugs and hemorrhages. It should never be relied on exclusively as a means of diagnosis. Weiss¹ reviews 23 illustrative cases taken from Chrobak's clinic in Vienna, and from these concludes that the determination of the number of leukocytes forms in gynecology a substantial aid in differential diagnosis, in that constant leukocytosis with a number above 16,000 shows the presence of a suppurative process.

Fowler's Position in Abdominal Surgery.—Van Buren Knott² (Sioux City, Iowa) strongly advocates Fowler's position in cases of diffuse septic peritonitis. He considers it a curative agent in these conditions. The position is very simple, and consists in elevating the head of the bed from 24 to 30 inches and maintaining it thus for 24 hours. Knott also finds this position of great benefit in general abdominal work, and has employed it in 326 cases, covering the past 2 years. The majority of patients escape the discomforts and dangers of postoperative nausea and vomiting, colic is diminished, and flatus passes much earlier and more freely.

Disadvantages of the Trendelenburg Posture.—Frantz³ states that in 745 abdominal sections he did not observe a single case of serious circulatory disturbance following operations in the elevated position. Status of the pulse and respiration curves led him to the conclusion that the abdominal breathing is consequently diminished with the pelvis elevated, and that there is only a slight compensatory increase in thoracic breathing. Considering the effects of anesthesia, Frantz noted 19 cases of bronchitis—2.3 %—in 825 cases of ether narcosis in the dorsal position. In 493 cases in which the pelvis was elevated, 44 cases—8.9 %—of bronchitis occurred.

Value of Nonoperative Local Treatment in Gynecology.—Willis E. Ford⁴ (Utica, N. Y.) is of opinion that no one would deny that greater good had come from surgical treatment of diseases peculiar to women than was ever dreamed of by the early gynecologists who did not operate. No comparison of results could be made. He did not think it was true, however, that the specialty ought to become purely surgical. Pathology learned by pelvic and abdominal surgery ought to be clearer

¹ Wien, klin. Woch., July 9, 1903.

² Zent. f. Gynak., 1903, No. 32.

³ Amer. Med., July 25, 1903.

⁴ Amer. Med., Aug. 20, 1904.

and better than was ever discovered postmortem. It was fair to assume that men who did this work had a better idea of the natural history, progress, and dangers of these diseases than those who did not operate, and that the early treatment ought to be in the hands of men who are also doing surgical work. That the nervous habit could not be cured by surgery has been proved by the fact that the removal of diseased ovaries and such like operations on epileptic women had not cured the epilepsy or neurasthenia. The argument, therefore, was that in those ailments that tended to disturb the functions, especially those of the reproductive organs of men or women, the serious thing was not the pain experienced, but the permanent invalidism which was brought about by the protracted local sensations that in time disturbed the mental equilibrium and brought about the individual habit. These local irritations ought to be treated by skilled gynecologists, and not allowed to develop either the mental or physical ailments which were so common a result.

The use of normal salt-solution in the abdominal cavity is warmly recommended by Clark and Norris.¹ They conducted an elaborate experimental study upon the effect of saline solution upon the peritoneum of rabbits which had been subjected to lethal doses of *Staphylococcus aureus*. They also report a series of cases in which the saline solution was used, and from this combined clinical and laboratory study it was evident that the assertion that the use of peritoneal infusions is not beneficial, but actually dangerous, has been amply refuted. The following conclusions are drawn: 1. The use of salt-solution does not increase, but unquestionably minimizes, the dangers of pyogenic infection. 2. In addition to the reduction of mortality, the convalescence of the patient is rendered infinitely more comfortable and satisfactory through the reduction of thirst, the increase in the urinary excretion, and the minimizing of vesical irritation.

Adrenalin in Gynecology.—N. N. Fensmenoff² has used adrenalin in operating upon the vagina and the uterus. He found that adrenalin has no hemostatic effect on the vaginal mucous membrane. On the other hand, in operations upon the uterus, the drug has been very serviceable in stopping hemorrhage. The drug was applied on pledgets of gauze in the strength of 1:5000 or higher (up to 1:1000). He has also employed adrenalin with success in removing mucous polyps of the cervix.

Strong Alcohol in the Peritoneal Cavity as a Germicide and Stimulant.—J. Dougal Bissell³ described an operation he had performed for double pyosalpinx in which the entire pelvic cavity and the edges of the abdominal incision were swabbed with 95 % alcohol for germicidal purposes. He referred also to 6 other operations of the same kind in which he had adopted the same procedure with uniformly successful results, both as to recovery and as to primary union of the abdominal incisions. His conclusions are: Pure alcohol can be used on

¹ Jour. Am. Med. Assoc., Jan. 30, 1904.

² Jour. Akousherstwa, Oct., 1903.

³ Ann. of Gyn. and Ped., 1904.

the peritoneal surfaces without harm. It is probably of great value in septic cases because of the powerful germicidal properties. It is hemostatic. It is a powerful stimulant, and in cases of collapse and depression from loss of blood it can be advantageously used diluted with a little salt-solution.

Position During Narcosis.—The comparative frequency of paralysis of the brachial plexus after operation in the Trendelenburg posture is attributed by Rothe¹ to pressure exercised on the plexus at a point between the clavicle and the first rib. He has also noted a number of cases of minor disturbance, such as temporary numbness, "curling" sensations, etc., the effects of these unpleasant phenomena.

Methods of Anesthesia.—J. C. Webster² uses nitrous oxid largely in pelvic examination, and combines this with ether when a general anesthetic is necessary. He inclines, however, to the use of local measures whenever possible, employing Schleich's solution in many major operations, such as plastic operations upon cervix, vagina, and vulva, in opening the abdomen for the removal of diseased tubes, ovaries, and shortening the round ligament, myomectomy, supravaginal amputation of the uterus, appendicectomy, intestinal resection, etc. He sometimes gives a few drops of chloroform for the suggestive effect. He has removed a cystic fibroma weighing 87 pounds and performed vaginal cesarean section without general anesthesia. E. E. Montgomery and P. B. Bland³ recommend ethyl chlorid to allay pain and relieve muscular spasms in abdominal and pelvic examination. They claim as advantages the short time required for anesthesia, the quickness of recovery, the decreased tendency to nausea and vomiting, strongly recommending it for office practice. Its most effective employment is as a preliminary of ether or chloroform narcosis, since by its use distress and sensations of asphyxia may be avoided. They believe that it is decidedly safer than chloroform or ethyl bromid, and possibly safer than ether. The disadvantages are the experience required to effect profound anesthesia and the possibility of emergence from its effect at an important stage of the operation.

Vaginal Operation without Anesthesia.—J. V. Frommer⁴ reports several cases in which patients underwent vaginal operations without any general anesthetic because of strong contraindication. Two of the patients were aged 69 and 77 years. In regard to the patient of 77, he remarks that the sensibility during the operation was so slight that she only groaned twice. On the ground of these experiences Frommer recommends, where general anesthesia is contraindicated, to operate without it, with the help of local anesthetics. Also in each case a half-hour before the operation he used a small injection of morphin which tranquilizes the patient. As a local anesthetic he recommends the injection of a weak Schleich's solution into the perineum and the region of the vulva before operating; and he considers the injection of this into the connective tissue of the ligaments and tubes before ligation as superfluous.

¹ *Zent. f. Gynäk.*, 1904, No. 19.

² *Jour. Am. Med. Assoc.*, Apr. 23, 1904.

³ *Jour. Am. Med. Assoc.*, Apr. 2, 1904.

⁴ *Zent. f. Gynäk.*, Nov. 7, 1903.

Drainage in Operation for Pelvic Suppuration.—Baldy¹ claims that suppurative disease is practically the only condition in the pelvis in which drainage is a proper procedure. In nonsuppurative disease drainage is an admission that the surgeon has not learned the value and use of the needle and catgut. In ovarian abscess, pus-tubes, and abscess of the uterine wall (when it is justifiable to remove the uterus), in but rare instances is drainage necessary. The one thing which should most often decide the surgeon to drain is the acuteness and virulence of the infection. Suppurative disease of the pelvis itself, such as puerperal abscess free in the pelvic cavity (intraperitoneal), suppuration in the pelvic connective tissue (broad ligament, etc.), and pus in the pelvis as the result of bone or joint necrosis will always demand drainage, and the sooner it is established, the better. In the first two conditions vaginal drainage is the safest and best. Baldy does not drain more than possibly 5 % of his cases. If drainage is not instituted in a given case, other causes of symptoms of infection being excluded, the knowledge that the case was one for possible drainage, the temperature and pulse together with the vaginal examinations will render the nature of the trouble perfectly apparent, and will demand the opening of the vaginal culdesac into the peritoneal cavity, irrigation, and the introduction of a drainage-tube. In his judgment the risks of pelvic surgery are reduced to a minimum and the best interests of the patient subserved by dispensing with the drainage-tube whenever possible.

After-treatment of Abdominal Section.—L. E. Burch² says that the 3 most prominent symptoms after abdominal section are backache, thirst, and nausea. It is a mistake to tell patients that nothing can be done for the first symptom. Tell the nurse to rub the back with alcohol or place a small pillow beneath it, elevate or depress the knees, and smooth out the clothes. Hypodermatics of water often give relief from their suggestive effect. In severe cases the patient may be turned on the side, even during the first 24 hours, but as a rule this is not best. Thirst may be relieved by an enema of normal salt-solution while the patient is under the anesthetic; after consciousness is regained, water may be given in moderation. There is no adequate reason for the absolute withholding of water except in peritoneal sepsis, when rapid absorption is desired. Three measures are preëminent in the treatment of shock after section—heat, normal salt-solution, and adrenalin. The following points are worthy of emphasis: Avoidance of opium and the early movement of the bowels in desperate cases; absence of all relatives and friends from the sick-room until the crisis has passed; administration of water in almost satisfying quantities from the first; early propping up in bed, especially of old people; avoidance of milk as a diet until after the sixth day; the use of a saline enema for the relief of thirst at the completion of every abdominal operation.

Use of Bisection in Hysterectomy.—Howard A. Kelly³ strongly advocates bisection for removal of the uterus in nearly every condition

¹ Ann. of Gyn. and Ped., Jan., 1904.

² Southern Medicine, June, 1904.

³ Brit. Jour. of Obstet., 1903.

in which double ablation of the organ is indicated. He gives the following advantages of this method of proceeding: (1) It shortens the period of enucleation, bringing the operation to the point of closing the peritoneal and abdominal wounds; (2) the great uterine vessels, whose control constitutes the chief step of the operation, are promptly secured, and thus any dangerous hemorrhage avoided; (3) by the removal of the uterus, abundant room is afforded to deal with the adherent tubes and ovaries; (4) abundant light is shed upon the field of operation, and every step can be followed in all its minuter details; (5) new avenues are opened for releasing the adherent structures from below, from the front or behind, instead of simply working from above as formerly; (6) it is possible, with greater precision and security, to pack off the diseased structures, sequestering them from the general abdominal organs.

Gauze-bearing Tape and the Gravity Pad in Pelvic and Abdominal Surgery.—Fisher¹ claims that the tape obviates the annoyance of a miscount in the number of gauze pads. The gauze-bearing tape consists of a piece of white tape about a half-inch in width and of variable length (3 or 4 feet), armed at one end with a long, blunt-pointed needle or bodkin. The gravity pad is nothing more than a large gauze pad, concealed within its folds and fastened to the center of which is a lead plate, 2 by 3 inches, and weighing one-half pound. Instead of a single piece of lead, smaller plates of the metal may be held in quilted squares of the pad or at indifferent points. One end of a long piece of gauze was introduced into the abdomen, while the nurse quickly, and without any loss of time to the operator, perforated the other extremity with the needle and tape, securing its edges to the distal end of the latter with a turn-over tie. Other pads were strung on the tape in a like manner, but without the necessity of securing them with a knot, the first and successive pads acting as points of fixation for those that followed. No account was taken of the pads thus introduced, nor was this necessary, for the reason that, after a sufficient number were in use to answer the purpose indicated, the removal after completion of the operation simply depended upon the withdrawal of the tape to which all were attached. Rossel² says the method he describes has been used by his chief, Dr. Bircher, for 11 years without the loss of a pad. Each pad has sewed to one of its corners a linen cord 15 cm. to 20 cm. (6 in. to 8 in.) long, to the free end of which is attached a weight of from 2.5 gm. to 3 gm. (38.75 gr. to 46.5 gr.). When the pads are in place, the weights hang on each side of the abdomen.

Foreign Bodies in the Abdominal Cavity.—F. von Neugebauer³ reports 87 cases of foreign bodies left in the abdomen by operators, including forceps, scissors, and sponges. He quotes the remarks of R. E. Weir that he considers it almost impossible to guard against this contingency absolutely. We can only by great care reduce them to a minimum. Neugebauer is convinced that one chief cause of such acci-

¹ Ann. of Gyn. and Ped., Nov., 1903.

² Zent. f. Gynäk., 1904, No. 25.

³ Zent. f. Gynäk., Jan. 23, 1904.

dents is imperfect or bad anesthesia, leading to interruption or hasty conclusion of operation. Hence the necessity for an experienced anesthetizer. Another safeguard is such a position of the patient as gives the best command of the operative field by eye and hand. Another important matter is a sufficient illumination of the field of operation and a careful personal assistant. Then a multiplicity of instruments should be avoided, and forceps, scissors, sponges, etc., so arranged that the loss of any would be instantly noticed.

An Instrument to Facilitate Puncture Through the Vagina.—Flatau¹ names it "Führungsknopf"; it consists of a bulb which is so fissured and bored that a cannula can be passed through its center and that several different sizes of cannulas can be used. The bulb slips over the point of the cannula so that it is well protected and can be inserted into the vagina without injuring the mucous membrane, and when the instrument reaches the point that is to be punctured, the force exerted from without upon the cannula causes its point to escape from the protecting bulb and to enter the desired area, while the bulb remains against the mucous membrane of the vagina.

Technic of Abdominal Section.—F. Barrington² tabulates 100 cases of abdominal section for pelvic and abdominal lesions, and emphasizes several points gained from his experience. He considers the tier suture to be the only scientific method of closing the abdominal wall. His rule is to avoid drainage as far as possible; if drainage is necessary, it is done through the posterior vaginal fornix. Conservative surgery of the ovary is considered as of much more importance than of the tubes. Considerable space is given to the discussion of the treatment of the appendix in cases of pelvic disease. That organ should be removed whenever diseased or adherent to pelvic viscera. The appendix should always be investigated in recurrent attacks of right-sided pain; in operating for relapsing appendicitis in patients who have suffered from dysmenorrhea, the incision should be made internal to the right semi-lunar line in order to allow examination of the ovary and tube; in every case of appendicitis in the female a pelvic examination should be made before operation is begun. The only point raised in the postoperative treatment is the insuring of early intestinal peristalsis.

The Healing of Laparotomy Wounds.—F. W. Bukoemsky³ has made a series of experiments on animals in order to study the mode of wound-healing after laparotomy. He finds that union of the wound-edges may be perfect, even histologically, provided the edges do not curl inward. It is advisable to employ the finest suturing material, which better enables us to approximate the edges of the wound. The incision should be made laterally from the linea alba, or, still better, the linea alba may be completely removed and the broad muscular surfaces united. Since muscle-tissue is well nourished, such wounds heal promptly. The simpler the suture of an abdominal wound, the better, as a rule. Bukoemsky has often noted that deep sutures are injurious

¹ Zent. f. Gynäk., 1904, No. 27.

² Australasian Med. Gaz., Feb. 20, 1904.

³ Jour. Akousherstwa, Oct., 1903.

to the tissues, irritating them and producing edema, which may suppurate. The idea of absolute asepsis must be abandoned. Microbes have been found in 90 % of wounds healed by first intention. Edema supplies a favorable nutrient medium for bacteria, and therefore deep sutures are best avoided. In placing the sutures, we must guard against tightness, which often results in compression and death of muscular tissues. The lost muscle is then replaced by connective tissue. The best method of sterilizing catgut is by means of dry heat, at 150° C.

Rupture of Abdominal Scars.—W. N. Orloff¹ reports 2 cases and estimates the total number of recorded cases as 26. The occurrence is rare, but may take place immediately following the removal of the suture or some time later. To avoid the accident it is well to leave the suture in place for 12 or 14 days and relieve all tympanites by hot enemas or rectal tubes, since the causes which lead to the rupture are mechanic, causing constant or repeated tension of the abdominal wall, as vomiting, cough, tympanites. In all the cases recorded the operation was done after ovarian or uterine tumors or for cesarean section. This method of suture does not seem to have any direct relation to the rupture which occurs under the most varied kinds of womb closure.

The Prevention of Ventral Hernia.—Nikonow² believes that the following is a certain way of preventing hernia subsequent to operation. An incision is made about 2 inches to one side of the median line in opening the abdomen; after opening the anterior layer of the shaft of the rectus the muscle is separated by blunt dissection and is turned upward so that the posterior layer and peritoneum may be incised in the median line. At the end of the operation the peritoneum and posterior fascial edges are closed separately; the muscle is then replaced, and the anterior layers of the fascia and skin are sutured. E. Stanmore Bishop³ states that the percentage of cases in which ventral hernia develops after laparotomy is probably between 1 % and 2 %. Bishop has had 4 cases in 350 abdominal operations. One was in a woman of 29, who was operated upon for ovarian cyst; 3½ years after recovery a ventral hernia developed, which, after wide & subsequent operation, remained cured. Another was in a woman of 31 who had ventral fixation done for uterine prolapse. Within a year ventral hernia appeared and 3 subsequent operations had failed to effect a cure. The third was in a woman of 33, operated upon for pyelitis cystica; 4 years later ventral hernia appeared and 2 subsequent operations were required to effect correction; the last resulted fatally. The fourth case was that of a woman of 47 who underwent operation for a large tumor; 6 years later ventral hernia appeared and operation was required to effect a cure. This was so recent that the patient is still in hospital, but has not yet

The Septum Strich in Pyelitis Cystica.—A. L. Latham⁴ describes an operation for pyelitis cystica which is very simple and is made of the anterior wall of the bladder. It is a very simple and is made of separation of the bladder from the uterus and the removal of the

¹ Boston Med. Jour., 1907, 158, 1000.

² Brit. Med. Jour., 1907, 1, 1000.

³ J. Am. Med. Assoc., 1907, 1, 1000.

⁴ J. Am. Med. Assoc., 1907, 1, 1000.

septum is lessened or entirely closed by a purse-string suture, and the longitudinal incision also closed with interrupted sutures, strengthening and supporting the septum.

Plastic Closing of Vesicovaginal Fistulas by Means of the Cervix Uteri.—Küstner has shown that by the plastic use of the supravaginal portion to close a vesicovaginal fistula certain results can be secured. Thomson¹ reports 3 cases in which he used this procedure with satisfactory results, and was impressed with its mechanic power. There remains no doubt that through the use of the collum uteri for the closing of a vesicovaginal fistula an extensive surface and firm support are furnished and the chance of a permanent cure increased. Also, the conditions after the operation are normal, and the possibility of cohabitation, pregnancy, and delivery preserved. The broad wound surface he sutures with deep silkwormgut sutures. Lastly, catgut sutures guarantee permanent cure and exclude later complications on the part of the bladder. After the operation the catheter is permitted to remain 8 days to 10 days, and the sutures removed at the end of 2 weeks. Small fistulas may be remedied by a simpler process, but for large fistulas the plastic use of the collum uteri is Thomson's choice.

Pettazzi² admits the theoretic rationality of abdominal hysterectomy in carcinoma, but claims from experience that success is not certain. When possible, he limits the operation to selected cases. The vaginal route is advisable if the lesion permits. His experience in laparotomies has enabled him to observe the frequency of shock following abdominal interferences. He believes the abdominal cavity may be infected during laparotomy; cases of recurrent cancer are due to this very much more often than is admitted. He exercises a narrower selection than Mackenrodt's formula might render operable, for the reason that his results have been unsatisfactory in diffuse cases.

Stewart³ has compared the following **antiseptic treatment for sterilizing hands and vulva** with 28 other methods, and finds that it produces the best results. For mechanic cleansing he uses the following technic: A teaspoonful of lime and a teaspoonful of powdered pumice on a saucer with wooden nail-cleaners; a basin with 2 quarts of "cool" water mixed with 1 teaspoonful each of calx chlorata, of table salt, and of aqua ammonia, and of potassium carbonate. In this basin, a nail-brush. Dip the hands in this solution, take the wooden nail-cleaners, and apply the pumice under and around the nails. If you cannot get them speckless, then dip the wet ends into the chlorid on the saucer. Do not get lime on the sensitive skin. Work it under the fingernails with the stick and the pumice. See that it gets into every possible crevice. Then scrub hands, nails, and all in the solution with the brush. After thorough washing in the above mixture perform the 5 minutes' chemie toilet: two heaping teaspoonfuls of fresh (35 %) calx chlorata and 1 tablespoonful of U. S. P. (36 %) acetic acid to the pint of sterile water. If this solution stands for 10 minutes without stirring, the necessary

¹ Zent. f. Gynäk., Dec. 12, 1903.

² Il Policlinico, 1904, No. 14.

³ Med. Rec., Jan. 30, 1904.

chemic changes are complete. In sterilizing the vulva a solution one-third the strength of the above should be used. The same for compresses on septic wounds. The method depends upon the germicidal effect of free chlorin, which Stewart contends is almost ideal for the purpose.

Unusual Sequels of Submammary Hypodermatoclysis.—O. P. Humpstone¹ reports that a woman patient during delivery suffered such hemorrhage that hypodermatoclysis was performed; 600 cc. of salt-solution was injected, half under the left breast and half under the right. The injection was done rapidly, owing to the serious condition of the patient, massage being employed meanwhile. The fluid was promptly absorbed from beneath the left breast, but not from the right, which remained distended. On the fourth day an attempt was made to aspirate the fluid, without success; and an incision an inch long was made, and 200 cc. of turbid fluid and sloughing material evacuated. Cultures were negative; no milk had appeared in either breast. On the second day after incising the breast 225 cc. of milk escaped from the sinus, but none could be expressed from the nipple; the other breast did not functionate. Belladonna ointment and a tight bandage caused a cessation of milk secretion in the right breast within 4 weeks, and the breast healed spontaneously. Humpstone says: Hypodermatoclysis should, under all conditions, be given slowly and not too hot, particularly when, because of shock, the lymph-sinuses are slow in absorbing the fluid. If a "water boil" is formed, it should be evacuated promptly to prevent sloughing of the under surface of the breast, thus opening milk-ducts, which in a pregnant woman may secrete and delay prompt healing.

¹ Med. Rec., Feb. 6, 1904.

OPHTHALMOLOGY.

BY WALTER L. PYLE, M.D., AND SAMUEL HORTON BROWN, M.D.,
OF PHILADELPHIA.

Introduction.—An attempt to properly summarize the progress of ophthalmology during the past year is rendered impossible by the enormous quantity of work performed and the small amount of space at our disposal. Rather than to give passing mention to the various subjects and include them all, we have preferred to exercise selection and to give readable notices of the subjects which, in our judgment, are of most importance. Attention is, especially, called to the papers and discussions on eyestrain and the epoch-making work of G. M. Gould in this particular. Hand in hand with this may be noticed the decline of the tenotomy heresy and the newer investigations of Grossman and Tscherning on the physiology of accommodation. School hygiene and bacteriology are also considered. Randolph's investigations in ophthalmic bacteriology deserve mention in this connection. Brain injury in its relation to visual disturbance is discussed by Gamble in his report of a gunshot wound of the brain, and his conclusions have an important bearing on the physiology of vision. Blastomycosis of the lids, vernal conjunctivitis, and conic cornea are among the subjects of recent investigation. The true status of the Argyll-Robertson pupil is discussed at length. Verhoeff's discovery of a new membrane in the eye is of especial interest. Suker's conclusions as to the value of surgical treatment in Bright's disease with ocular symptoms deserve careful reading. The investigations of de Schweinitz, Wilder, Ball, and Weeks in regard to the cervical sympathetic are considered in detail. In conclusion, reference must also be made to the section on ocular symptoms in general diseases, methyl-alcohol intoxication, phototherapy and radiotherapy, radium, and dionin.

AMETROPIA.

The Reflex Effects of Eyestrain.—In a symposium on the eye in its relation to functional nervous diseases before the New York Academy of Medicine,¹ C. S. Dana considered the **mental disturbances produced by eyestrain**. He divides eyestrain into two varieties: (1) That in which there is an automatic effort of the brain and oculomotor nerves to adjust the eye so as to overcome abnormalities in refraction, accommodation, and imperfect muscle-balance. (2) That in which the eyestrain occurs

¹ Med. Rec., Apr. 9, 1904.

when the eye is more seriously defective and the receiving apparatus of the brain fatigued. Then the cortical centers are brought into play, and the imperfect vision is appreciated with some sense of a distinct and fatiguing effort, to supplement the ordinary automatic mechanism of the eye. He further states that most minor ocular defects could exist without producing bad effects, and that in only a few cases were bad mental results seen to follow eyestrain directly. In his opinion, when the mind is a good mind, the visual machinery does not overthrow or seriously affect it. C. W. Cutler, in the same meeting, considered **headache, migraine, and other sensory disturbances produced by eyestrain.** He defined migraine, or sick headache, as a manifestation of an unstable nervous organism, influenced in many cases by various peripheral excitations, and that these, or rather their anatomic bases, were frequently transmitted from one generation to another in members of the same family, and formed the hereditary feature upon which stress had been laid as an essential characteristic of migraine. He believes it is fair to assume that migraine is often a reflex neurosis of ocular origin, but that it is also due to other sources of peripheral irritation, such as the pelvic organs, nose, gastrointestinal tract, etc. B. Sachs discussed the **relation of epilepsy, chorea, and other motor disturbances of the nervous system to eyestrain.** In his personal experience he does not know of a single case in which the epileptic seizures had been altogether inhibited or even diminished in number by the wearing of glasses, by cutting of muscles, or by any other ocular measures which had been adopted. The influence of eyestrain on St. Vitus' dance he considers small, but in habit chorea he states that it may be a cause. George M. Gould¹ has made a very exhaustive study of the literature of **migraine**, and does not find any unanimity of opinion as to the cause or treatment of this condition. He believes that migraine, in its so-called typical or in its multitude of atypic forms, is but one of the many manifestations of eyestrain, and may be cured by lenses correcting the causative astigmatism.

Nonoperative Relief of Eyestrain for the Possible Cure of Epilepsy.—Wm. P. Spratling² (Craig Colony for Epileptics, Sonoma, N. Y.), in a study of 66 epileptics who had been wearing correcting lenses for one year prescribed by Drs. Gould and Bennett, shows 1 case in which the disease was arrested and in which cure seems probable; 5 cases in which the disease had been previously arrested by other modes of treatment, but the improvement had undoubtedly been sustained by correction of the ametropia; 11 cases in which there was an apparent decrease in the number of attacks; 33 cases in which the number of attacks was increased; and 16 cases in which there was no perceptible change in the attacks. The results, while disappointing to Spratling, served to strengthen his convictions that epilepsy is not a "single prescription disease." G. M. Gould (Philadelphia), in going over these results in the same paper, reaches much more favorable conclusions. He believes that by these tests eyestrain has been demonstrated to be a possible

¹ Jour. Am. Med. Assoc., Jan. 16, 1904.

² Amer. Med., Apr. 9, 1904.

causal factor in 33 % of epileptics, and that in 19 of the patients tested the number of seizures was lessened by over 44 % by wearing correcting lenses.

Ocular Headache.—M. W. Zimmerman¹ (Philadelphia), in a statistical study of 2000 cases consulting him for ocular treatment, shows that in 67.8 % of his private work and 74.9 % of his hospital work headache was present. In tabulating the ametropia in these cases it was found that compound hyperopic astigmatism was the most common error and was present in 48.78 % of all cases presenting headache. An interesting feature of this study is the occurrence of headache in 21 cases of simple myopia, 13 of which were myopia exceeding 3 D. In 8 of these cases the wearing of concave glasses without other treatment served to cure the headache. This observer notes 5 cases with headache and asthenopic symptoms, in which, during complete cycloplegia, all lenses were rejected. In 215 instances it was impossible to demonstrate any imbalance of the extra-ocular muscles. During the early use of glasses he advises the instillation of eserine salicylate ($\frac{1}{16}$ to $\frac{1}{20}$ grain to the ounce). In 794 cases in which the results of treatment by optical means were recorded, 86.1 % of practical cures were noted. The percentage of failures was relatively higher in hospital work.

The importance of asthenopic reflexes is fast gaining ground in Great Britain. Simeon Snell, a well-known British ophthalmologist, in discussing this subject reaches the following conclusions: 1. That eyestrain is the cause of a large proportion of headaches, often of a very aggravated character. 2. That various other neuroses are met with in association with headache, and among these may be mentioned the following: mental depression, nausea, indigestion, vomiting, insomnia, giddiness, choreiform movements of the eyelids and face, etc. 3. That relief is afforded to these conditions by correcting the error of refraction, which can be ascertained only after careful examination. 4. That for such examination a mydriatic is absolutely essential. 5. That frequently no complaint is made of defect of vision. 6. That the ametropia is frequently of low degree, 61.2 % of his cases needing 0.75 D. cyl. and weaker. 7. That a cylinder of 0.25 D. is of great value. 8. That anisometropia is frequently present and requires proper adjustment. 9. That in a certain number of cases the muscle-balance is faulty and necessitates the prescribing of prisms.

Eyestrain as a Causal Factor in Sinusitis.—W. L. Phillips² (Buffalo, N. Y.) records 10 cases of sinusitis which were directly traced to eyestrain, and which progressed to recovery after correcting the ametropia. His explanation of the relation between the two is quite ingenious. He states that the nervous system bears an important part in the production of secretion, and that the vasomotor nerves distributed to the muscular coat of the arteries control secretion. To produce clear vision with an astigmatic eye one must use up all the residual nerve-energy because of the increased work required to focus an eye that has different meridional lengths. This drain of nerve-force robs other parts of the required

¹ N. Y. Med. Jour., Nov. 21, 1903.

² Amer. Med., Sept. 17, 1904.

energy to keep up a normal condition and acts as would a division of the vasomotor nerves, dilating the bloodvessels and increasing the amount of mucus in the frontal sinus. Should this accumulate, it becomes infected by bacteria introduced from the nasal passages.

Frontal Sinusitis as a Cause of Accommodation Paresis.—H. Manning Fish¹ (New Orleans) has found that frontal sinus disease is a frequent cause of disturbance of accommodation (loss of either range or power), and mentions that in over 250 recent cases of asthenopia observed by him it was the disturbing factor in 10 %. He also states that in many other such cases sinus involvement was suspected but could not be proved for various reasons. This observer believes that the cases termed hysteric asthenopia and neurasthenia of childhood may in many instances be traced to pent-up secretions in the frontal sinus.

Torticollis and Spinal Curvature due to Eyestrain.—George M. Gould² gives a complete history of a case of torticollis cervicalis and spinal curvature occurring in a girl of 18 years of age in whom a change of 15° in the axis of the right lens of her spectacles brought about relief of symptoms and ultimate cure of the condition. Gould also relates the histories of other cases in his own experience and other similar, previously recorded cases in which the condition was attributed to imbalance of the ocular muscles. He draws the following practical conclusions from these cases: 1. Habitual abnormal position of the head is frequently the cause of spinal curvature. 2. These abnormal positions may be due to some error of refraction, which necessitates the torticollis, wry-neck, cant, or depression, in order to secure clearer vision. 3. The error of refraction is usually a slight asymmetry of the axes of astigmatism, whereby the clearer-seeing or most-used eye (usually the right in right-handed persons) has an axis 10° or 15° to either side of 90° or 180°—*i. e.*, at about axes 75°, 105°, 165°, or 15°. 4. The heterophoria, which has been the supposed cause of the functional torticollis, etc., is itself usually a result of the refractive error, proper correction of which, at a sufficiently early age, cures the heterophoria, the torticollis, and the spinal curvature.

H. W. Kilburn³ (Boston), in a preliminary communication regarding this subject, relates the clinical histories of 3 very interesting cases. The patients were children from 8 to 12 years of age. Head-tilting and spinal curvature were present in each and resisted the ordinary physical methods of treatment, but eventually were relieved by the wearing of proper correcting lenses and certain exercises.

Surgical Treatment of Myopia.—H. V. Würdemann and Nelson M. Black⁴ (Milwaukee) report 3 cases of high myopia in which the crystalline lens was removed, with resultant increase in the visual acuity, enlargement of the retinal images, enlargement of the visual field, and increased range for near work.

Simeon Snell⁵ records the results of removal of the lens in 60 cases

¹ New Orleans M. and S. Jour., Feb., 1904.

² Amer. Med., Mar. 26, 1904.

³ Boston M. and S. Jour., Mar. 24, 1904.

⁴ Jour. Am. Med. Assoc., Nov. 28, 1903.

⁵ Brit. Med. Jour., Feb. 27, 1904.

of high myopia. He believes the operation should be limited to myopia of 14 D. and upward. This necessarily limits the number of suitable cases. He performs a needling operation similar to that employed for lamellar cataract, and having the same dangers. The possibility of increased tension after the operation is mentioned. In only 2 cases was retinal detachment a complication. The results of a successful operation are as good or better distance vision without glasses than previously with their aid. The myopia disappears or is present only in low degrees, or there may be a small amount of hyperopia.

Astigmatism.—Julius Pohlman¹ (Buffalo), in a work undertaken to determine the changes in the refraction of individuals, has produced some interesting data in regard to variations in astigmatism. In a study of 900 cases examined and reexamined, nearly every third showed changes in the astigmatism; 50 %, half of all the changes found, presented a simple increase in the quantity of astigmatism without any change of axis; 31 % gave merely a change of axis; these two combined accounted for 81 % of all the changes recorded. The other 19 % were almost equally divided between—(1) increase of astigmatism plus change of axis, 7 %; (2) change of regular to irregular, 6 %; and (3) change of irregular to regular axis, 6 %.

The Prescription of Cylindric Lenses.—N. C. Steele,² in considering this subject, arrives at the conclusion that many cases with low degrees of astigmatism with the best meridian horizontal or nearly so, should not have the astigmatism corrected, at least not fully corrected, in lenses for near use only. In astigmatism with the best meridian horizontal he is guided in prescribing near lenses by the following rules: If the astigmatism is of low degree with the best meridian horizontal, he entirely omits the cylindric element of the lens. In high degrees of astigmatism he omits a part of the cylindric element, thus undercorrecting the absolute amount of astigmatism shown to exist by the usual tests. He depends on the spheric lenses or the spheric part of the spherocylindric lenses to correct all or a portion of the astigmatism.

OCULAR MUSCLES.

Cerebral Centers of Divergence and Convergence.—W. M. Bechterew,³ in a series of experiments on apes, found, by irritating a certain well-defined area of the cortex in the region of the gyrus angularis, that the eyes are made to diverge. The same result follows stimulation of an area in the frontal lobe just in front of the middle portion of the precentral fissure. He therefore assumes the existence of 2 cortical centers of divergence. Beside these cortical centers, Bechterew's experiments demonstrate the existence of a subcortical reflex center of divergence located in the 2 anterior corpora quadrigemina, while the 2 posterior corpora contain the analogous subcortical centers of convergence. The cortical centers of convergence are located in the occipital lobe

Amer. Med., Mar. 19, 1904.

² Ophthal. Rec., Dec., 1903.

³ Obosrenie Psychiatrii, July, 1903.

behind the union of the fissura sylvii with the first temporal fissure and in the lower part of the gyrus angularis, respectively.

Nomenclature of the Movements and Motor Anomalies of the Eye.—Alexander Duane¹ suggests the following new terms: *Lateriversion*, movement of both eyes laterally; *dextroversion*, movement of both eyes to the right; *levoversion*, movement of both eyes to the left; *sursumversion*, movement of both eyes up; *dextrosursumversion*, movement of both eyes up and to the right; *levosursumversion*, movement of both eyes up and to the left; *deorsumversion*, movement of both eyes down; *dextrodeorsumversion*, movement of both eyes down and to the right; *levodeorsumversion*, movement of both eyes down and to the left; *dextroclination*, tilting of both vertical meridians to the right; *levoclination*, tilting of both vertical meridians to the left; *conclination*, tilting of the top ends of the vertical meridians toward each other; *disclination*, tilting of the top ends of the vertical meridians away from each other. He also suggests that the ability to overcome prisms, bases in, should be designated as *prism divergence*, and the power of overcoming prisms, bases out, as *prism convergence*. The use of *right diplopia* to denote vertical diplopia with the image of the right eye below (corresponding thus to right hyperphoria) and of *left diplopia* to denote the reverse condition is also advocated. *Dyskinesia* should be employed to denote that condition in which the movements of parallel rotation, of divergence, and of convergence are of normal extent, and yet some or all of these movements are associated with pain and a sense of strain, and cannot, therefore, be maintained for any length of time. In connection with squint he prefers *comitant* to concomitant and *continuous* to constant.

The Screen-test as a Precise Means of Measuring Squint.—Alexander Duane² (New York city) states that when properly performed, this method is not surpassed in accuracy by any other objective method, and possesses many advantages over other methods. He seats the patient about 20 feet from the test-object, which is a round target, one foot in diameter, colored black, with a white one-inch bull's eye placed on a level with the patient's eyes. The attention of the patient being directed to the test-object, a card is now passed quickly back and forth several times from one eye to the other, the examiner standing somewhat to one side, carefully watching both eyes and noting if either eye moves. If there is no movement, orthophoria, or within 2° of it, is present. A prism of 2° is then placed before the eye in all directions, and the movements thus induced noticed. To determine the degree of deviation prisms are placed before the eyes until there is overcorrection. The deduction of 2° from the value of the first prism that overcorrects gives the true amount of deviation. The delicacy of this test is enhanced by the parallax test, in which the patient indicates the direction in which the test-object appears to move as the screen is passed from eye to eye. If the right eye is uncovered and the movement is to the right, *esophoria* is present; if to the left, *exophoria*; if the movement is down, *right hyperphoria*; if the movement is up, *left hyperphoria*. The first prism that abolishes the

¹ Trans. Am. Ophthal. Soc., 1903.

² Ann. of Ophthal., Oct., 1903.

movement indicates the degree of deviation. When the number marked on the prism indicates its refracting angle, Duane employs a table for the conversion of the values thus obtained to measures of arc such as are given by the perimeter. For small deviations (below 20° of arc) this method is rigidly accurate.

Development of the Faculty of Binocular Vision.—E. Jackson¹ (Denver) presented before the American Medical Association, June, 1904, an instrument to aid in the development of binocular vision, which was adapted for all objects without special preparation and for all acts of vision. The instrument makes use of the principle of lateral inversion of images formed in mirrors; it consists of two inclined mirrors, one of which can be rotated; the images formed in the mirrors are received through a hole in the back of the appliance. The apparatus should, therefore, be placed before the deviating eye.

Overcorrection of Convergent Squint without Operation.—S. Theobald² (Baltimore) gives an account of a case of well-marked inward squint being converted into an outward squint simply through the influence of glasses. Compound hyperopic astigmatism was present in each eye. Slightly reduced correcting lenses with which prisms were incorporated were prescribed. Three years later there was present, with the glasses on, an evident divergent squint of the eye which had previously been convergent. The correcting lenses were changed several times during this period. A noteworthy feature of this case was the persistence of upward squint when the quite strong glasses which were being worn were removed.

The Fallacies in Tenotomy for Heterophoria.—The following editorial comment³ on this subject is worthy of quotation: The vogue, now happily waning, of tenotomy of the ocular muscles for heterophoria was based upon several errors of diagnosis and inference which, although now clearly exposed, have had great influence in the past. To review the mistakes and their causes may now be of service in helping the mind to avoid similar blunders of observation and logic: 1. The first mistake was that of taking *post hoc* for *propter hoc*. The advocates of tenotomy looked upon the fault as one of mechanics, the muscles and tendons, their insertions, shape of the orbit, etc., being considered as the only factors at work. We now recognize that these peripheral structures had little or nothing to do with causing the conditions, and that the dominant factor was innervational. The nerve-centers, not the muscles and tendons, were at fault. 2. The secondary and tertiary causes were taken for the primary cause. The crude mechanisms of the muscles, tendons, insertions, etc., should have been recognized as the mere instruments of ametropia. 3. The fallacy of "latent" heterophoria vitiated every test and argument. Prisms worn for a time were supposed to make the "latent" defect manifest. In fact, they temporarily created a new defect. One can soon create any kind and almost any degree of heterophoria by ordering such prisms to be worn. 4. The advocates of

¹ Abstr. Amer. Med., July 30, 1904. ² Am. Jour. Ophthal., Apr., 1904.

³ Amer. Med., Apr. 16, 1904.

tenotomy found esophoria tremendously prevalent, and called it heterophoria, whereas low degrees of esophoria are normal, and are desirable for those who use their eyes for much near work. 5. Moderate degrees of hyperphoria are much more certainly, accurately, and easily corrected by prisms incorporated in the lenses required for correction of the ametropia than by operation. 6. Exophoria is simply insufficient adduction power, and this may be soon and absolutely increased to any extent by prisms, bases out, used as temporary gymnastic exercise. 7. Heterophoria, being a result of ametropia, was not cured by tenotomy, which, indeed, rendered the final cure more difficult, and sometimes even impossible. 8. Crediting the good results which followed tenotomy *plus* proper glasses to the tenotomy alone, showed incorrectness of observation and an unscientific logic. 9. The disappointment that followed the extended trial and exploitation of the theory involved in the 8 preceding considerations has been the greatest source of skepticism and error in recognizing ametropia as the true cause of eyestrain, and of the many systemic reflexes produced by it.

Nystagmus.—Trombetta and Ostino¹ believe, from the results of experiments and clinical data in their possession, that there exists a close **connection between the ocular movements and the vestibular nerve.** The presence of a center for general and ocular movements in the labyrinth, as advanced by Ewald and Stein, is accepted by these observers. They conclude that the cause of nystagmus lies in a disturbance of innervation of the ocular muscles brought about by an abnormal reflex stimulation of the ampullas of the semicircular canals. The cessation of the movements on removal of the canals they believe to be positive proof of this assertion.

ACCOMMODATION.

Physiology.—Karl Grossman,² in studying the case of a young man, 26 years of age, with congenital bilateral aniridia and small anterior and posterior polar opacities in both lenses, took advantage of the opportunity to observe the behavior of the lens during accommodation. Eserin was instilled, and the lenses, which previously were homogeneously red, became divided into 3 zones: an inner one, a darker middle one, and an outer red zone; the ring-shaped middle zone was the expression of difference in refraction between the central and peripheral portions. The striking features of this case were the tremor of the lens and the appearance of the ciliary processes when the eserine was used, both of which were absent in voluntary accommodation. The circumference of the lens remained perfectly circular, but its equatorial diameter was decreased. The thickness of the lens was increased, the distance between the lens and the cornea decreased, and the posterior surface of the lens bulged backward. He attributed the tremor of the lens to relaxation of the zonule. Grossman concludes, from his observation of

¹ *Annali di Ottalmologia*, 1903, xxxii, Fasc. 9, 10, p. 694.

² *Ophthal. Rev.*, Jan., 1904.

images of lights reflected from the surfaces of the lens, that its posterior surface forms a posterior lenticonus with increased central curvature and flattening of the periphery similar to the changes in the anterior surface.

M. Tscherning,¹ in an attempt to claim priority in this subject, refers to the examination of 4 cases with the view of determining the mechanism of accommodation, and reaches the following conclusions: (1) The change in the anterior surface of the lens produces about $\frac{1}{10}$ of the accommodation; the change in the posterior surface, $\frac{4}{10}$. (2) The lens increases in thickness during accommodation; the anterior surface moved forward in all the cases, while the posterior surface moved a little backward except in the first case, in which it seemed to move rather slightly forward. (3) The anterior surface becomes flattened toward the periphery. This flattening, already manifest in the state of rest, becomes strongly marked during accommodation, while at the same time the curvature in the middle increases. (4) By comparing, in diopters, the refractive value of the changes in the anterior surface of the lens, is found a difference of about 3 diopters between the central and the peripheral parts. In addition to this, on examining the eye by skiascopy or otherwise, is found a difference of 5 or 6 diopters between the central and peripheral accommodation; from which it may be inferred that the posterior surface of the lens must also become flattened toward the periphery during accommodation. His theory as to the part taken by the ciliary muscle in accommodation is repeated. [This work was also published by a pupil of Tscherning, Ed. Besio.²]

SCHOOL HYGIENE.

Examination of School-children.—F. Allport³ (Chicago), in a well-written paper, urges the more widespread adoption of systematic examination of school-children as regards their eyes, ears, noses, and throats by school teachers at the beginning of the school term. He suggests the use of some suitable card on which to record and also to notify the child's parents of his or her condition, and gives an account of the system he employs. Cohn⁴ (Breslau), before the International Congress of School Hygiene at Nuremberg, referred to the work done by various observers along this line, and briefly reviewed his personal investigation extending over a period of 40 years. He concludes that the number of short-sighted children steadily increases with the development of the school, from the lowest infant department through the high school, that myopia increases from class to class; or, in other words, it is a product of school-life. His experience during the last 10 years has demonstrated to him that the visual acuity of young children in the open air is 2 or 3 times greater than that of children in the school-room. He advocates the appointment of school ophthalmologists. D. W. Wells⁵ (Boston) employs

¹ Ophthal. Rev., Apr., 1904.

² La forme du cristallin humain, Jour. de Physiol. et Pathol. Gen., July and Sept., 1901.

³ Ann. of Ophthal., Apr., 1904.

⁵ New England Med. Gaz., Apr., 1904.

⁴ Apr., 1904.

a card system for recording the results of the tests which are made by the teacher. The results are set down on a separate card for each pupil, and this card is passed along with the child at each promotion. Subsequent examinations are entered in the appropriate grade column. Thus the card becomes a permanent record of his sight and hearing during his school-years. The teacher receives appropriate instruction as to the carrying-out of the tests from an oculist, who subsequently examines the card records. Pupils with $\frac{7}{16}$ vision, who fail to hear the tick of a watch at 36 inches, and who fail on the Thomson test for color-perception, are recorded as defective, and their parents are notified to that effect and advised to consult their family physician or a specialist in regard to their children. The physician consulted is asked to make a report and give recommendations to the teacher as to the care of the child in the school-room.

Eye Defects in Students.—E. J. Swift,¹ in a study of the ocular conditions in the students of the State Normal School at Stevens Point, Wis., summarizes his observations as follows: 1. Only 22.22 % of the 216 students examined had normal vision. 2. Of those with normal vision only one failed to disclose some manifest error of refraction or muscle insufficiency. 3. Thirty-five of the 48 with normal vision showed manifest compound hyperopic astigmatism in one or both eyes, while of the remainder, 4 had simple hyperopic astigmatism and 4 others hyperopia. In most of the cases more or less muscle insufficiency was evident. 4. In 30 % of those examined the vision of one or both eyes—the most defective where there was a difference—was below 20/30, while between 19 % and 20 %—nearly as many as had normal vision—were unable to read the 20/40 line at a distance of 20 feet.

Ocular Hygiene in Mexican Schools.—M. Uribe Troncosco² examined the eyes of more than 500 pupils in the Normal School of Mexico City, and found that pure hypermetropia diminishes in proportion to the age, but hyperopic astigmatism becomes more frequent. The number of cases of myopia amounted to 19 %. He recognizes a race influence and states that the head of the Mexican native is narrow and convergence is easy, thus accounting for this low percentage. The abundant and prolonged daylight, even in the winter time, has a bearing on the comparative infrequency of myopia, but other forms of ametropia are frequent, according to this observer. Fully 42 % of the pupils examined had not sufficiently clear vision to enable them to follow the teacher's explanation on the blackboard, and 25 % required such close approximation that it was incompatible with the functional integrity of the organ.

BACTERIOLOGY.

Bacteria in the Eye.—R. T. Randolph³ (Baltimore), in considering the bacteria concerned in the production of ocular inflammation, recognizes the fact that certain organisms are normally found in the conjunc-

¹ Ophthal. Rec., Mar., 1904.

² Ophthal. Rec., Mar., 1904.

³ Jour. Am. Med. Assoc., Oct. 3, 1903.

tiva, and their pathogenicity varies. He further states that all the organisms causing disease of the conjunctiva require to some extent a helping hand, often in the form of an abrasion or injury to the epithelium, to render them capable of doing harm. Whatever lowers local resistance favors the multiplication of any bacteria that may happen to be in the conjunctival sac; and in overwhelming numbers, bacteria, ordinarily harmless, may become dangerous. Taking these various facts into consideration, he believes that antiseptic irrigations of the normal conjunctiva lessen its resistance and should be abandoned.

The Importance of Bacteriologic Researches in Ocular Surgery.—

T. Bach,¹ in a dissertation on this subject, remarks that infection during ocular operations may be induced by the air, the hands or person of the surgeon, eye-drops, edges of the eyelids, conjunctival sac, tear-passages, and by the instruments. As preventive measures in ophthalmic operations he advises thorough cleansing and irrigation of the lids and adjacent parts with physiologic salt-solution or some indifferent fluid, skilled sterilization of the instruments and cocain, and the avoidance of conversation across the field of operation as much as possible. He believes that repeated winking or blinking is one of the best means of cleansing the eye, and hence as a means of preventing postoperative infection he applies a metallic shield or metallic capsule instead of a bandage, which allows free movement. He also refers to the use of disinfecting ointments as a means of antisepticizing the edges of the lids to prevent infection.

An Unrecognized Source of Infection during Ocular Operations.

—M. de Leon² has demonstrated that there is risk of infecting a wound during operation by particles of bacteria-laden saliva projected from the surgeon's mouth during the act of speaking. He found that by speaking over agar plates (carefully shielded from atmospheric contamination) he could obtain numerous colonies of microorganisms, including staphylococci and streptococci, the virulence of which was demonstrated by inoculating a large number of guineapigs, white mice, and rabbits. As means of avoiding infection in this manner he advises silence, especially during a difficult operation, the rinsing of the mouth with an antiseptic strong enough to kill the microorganisms, but not too irritating or poisonous, the use of masks of single or double gauze, and the wearing of a respirator containing cotton-wool, placed between perforated metal plates. The last affords the greatest degree of security and does not interfere with speech.

Mouth Veil for the Avoidance of Infection in Eye Operations.—

Axenfeld³ recommends that the surgeon, in order to prevent infection by germ-laden saliva, wear a veil of double gauze, fastened to a wire running from ear to ear under the nose, and hanging down to the chest, the lower edge being held in place by tapes.

¹ Zeit. f. Augenheilk., Jan., 1904. ² Med. Press and Circ., Jan. 27, 1904.

³ Klin. Monatsbl. f. Augenheilk., Oct., 1903.

VISUAL DISTURBANCES.

Hallucinations of Vision.—Howard F. Hansell¹ (Philadelphia) refers to the erroneous mental conceptions derived from diseases of the interior of the eye, by which the retinal or nervous stimulus is perverted. Among the ocular conditions responsible for these delusions of sight he mentions errors of refraction, disturbance of the ocular muscle-balance (palsies especially), opacities of the media, and disease of the retina, choroid, and optic nerve. This observer further states that true hallucinations of vision are independent of ocular conditions and are properly referable to mental disorders.

Visual Disturbances in Brain Injury.—William E. Gamble² (Chicago), in the study of a case of gunshot injury in the left temple, $1\frac{1}{2}$ inches back of the left eye, $\frac{1}{2}$ inch above the zygoma, in which mind-blindness, verbal amnesia, amnesic color-blindness, word-blindness, dyslexia, optic atrophy, right homonymous hemianopsia, right hemianesthesia, and right hemiparesis eventually followed, and of the results obtained from experiments on the cadaver undertaken to locate the site of the bullet under such circumstances, shows that: 1. Verbal amnesia is a result of lesion in the cortex of the third and fourth temporal convolutions, left hemisphere, and injury to cortex of anterior end of inferior occipital convolution. 2. The amnesic color-blindness and alexia result from subcortical lesion in left middle occipital convolution. 3. The reacquirement of these functions in a man 28 years of age is a slow and tedious process of education of the specialized though undeveloped cells of the right hemisphere, requiring years for even partial accomplishment. 4. Injury to the optic radiations of Gratiolet may produce negative scotoma, contrary to the teaching that such a lesion produces positive scotoma. 5. Primary atrophy of the optic disks occurs in lesions of the left temporooccipital region.

Ocular Examinations of Criminals.—True, Delord, and Chavernac³ examined the ocular condition of 556 inmates of the Central Prison at Nîmes with a view to determining the existence of ocular stigmas. The results of these examinations did not show any notable peculiarity with respect to visual acuity, visual fields, or color vision.

Right-eyedness and Left-eyedness.—G. M. Gould,⁴ believing that right-handed persons are naturally right-eyed, and the left-handed are left-eyed, has asked that the following questions concerning left-handed persons be answered with a view to collecting data on this subject: (1) Name or initials, residence, sex, age, and occupation. (2) Is the left-handedness complete or only for some of the acts usually performed with the right hand by right-handed persons? (3) Is the left-handedness the result of accident to the right hand or arm or did it exist from infancy? (4) With which eye is a gun sighted, a board or yard-stick proved straight, or a table level, etc.? (5) With which eye without glasses is the vision of letters across the room in a good light the clearest? (Alternate covering either eye, not closing it.) (6) If glasses are worn for

¹ Amer. Med., Jan. 16, 1904.

² Jour. Am. Med. Assoc., Jan. 23, 1904.

³ Ann. d'Oculistique, Jan., 1904.

⁴ Science, Apr. 8, 1904.

distant vision, the oculist's prescription, and the relative sharpness of vision of each eye with the glasses. He refers to the time-honored custom of drivers maintaining the right side of the road, the situation of the engineer on the right side of the locomotive cab, the right-handed mechanic tools, the bringing of the musket to the right shoulder in firing, and numerous other instances of the general acceptance of right-handedness, all of which, he thinks, are influenced by right-eyedness. He cites 3 cases in support of this view and thinks that ambidexterity should be discouraged rather than stimulated.

EYELIDS.

Hypertrophy and Degeneration of the Meibomian Glands.—Herman Knapp¹ (New York city) describes 3 cases of adenosarcoma having its origin in the meibomian glands. In the primary stage glandular hypertrophy was the only symptom. The diagnosis was confirmed by the microscope. He advises removal as soon as hypertrophy is manifest.

Favus of the Eyelid.—E. Treacher Collins² gives an account of a case of favus occurring on the eyelids in a boy 16 years old. The disease appeared as 4 circular patches on one upper eyelid, each consisting of a dry crust, the center of which was depressed and black, while the slightly raised margin was of a sulfur-yellow color. The diagnosis was confirmed by the microscope and by a somewhat impure culture obtained on maltose-agar.

Persistent Edema of the Eyelids Due to Syphilis.—E. F. Snyder³ reports the case of a man of 33, who became unable to use his left eye because of persistent edema, the lid hanging down over the eye. The swelling had gradually grown to its present size during the 4 months past; he had never had pain, redness, or discharge. The eyeball was absolutely unaffected; the lid had a persistent, dough-like feel. No other lesions could be discovered anywhere. The patient confessed to a syphilitic infection 7 years previously. The affection disappeared under specific treatment.

Blastomycosis of the Eyelids.—Casey A. Wood⁴ (Chicago) gives the history of a case of blastomycosis of the eyelids in a girl 14 years of age. Three months before consulting Wood she noticed a small growth, like a sty, on the central margin of the left lower lid. This formed a crust which, when removed, exposed a raw, discharging sore. On presenting herself to Wood the growth was about the shape and size of a large peanut, 27 by 5 to 7 mm. long and 3 mm. thick, with abrupt, rounded walls of apparently normal but reddened skin. At the intermarginal space the growth had destroyed the dermal edge and the conjunctiva was red and thickened. Microscopic examination of the growth showed the characteristic organisms and typical histologic changes. The internal administration of potassium iodid and the local application

¹ Trans. Am. Ophthal. Soc., 1903.

² Trans. Ophthal. Soc. of the United Kingdom, 1903, vol. xxiii.

³ Arch. of Ophthal., 1904, xxxiii, 139.

⁴ Ann. of Ophthal., Jan., 1904

of the röntgen ray caused rapid subsidence of the growth. Wood also gives the particulars of 6 published and 2 unpublished cases of this affection involving the lids. Wilder¹ (Chicago) records some additional cases of this disease and remarks the frequency with which it attacks the eyelids. Its involution under the same kind of treatment as in the preceding case was also noted.

Associated Movement of Eyelid and Jaw.—G. C. Harlan² (Philadelphia) relates the history of a case in which there was an acquired uncontrollable spasmodic twitching of the left eyelid during mastication. It was coincident with opening the mouth and worse when the patient looked down. The patient was a well-developed child, 4 years of age, of good intelligence, without any other signs of either local or general disease. The pupils, the movements of the eyeballs and the lids, and the ophthalmoscopic appearances were normal. He refers to the various investigations on this subject, but states that none of the theories advanced applies to this case, as it is not a congenital condition.

Blepharoplasty by Means of Two Pedunculated Flaps.—Etienne Rollet³ (Lyons) employs the following method of blepharoplasty with two pedunculated flaps, devised by himself, when he has had to deal with any considerable loss of substance of the eyelids (Figs. 46, 47). The cicatricial tissue is incised but not excised, and reflected in such a manner that the flaps can be im-

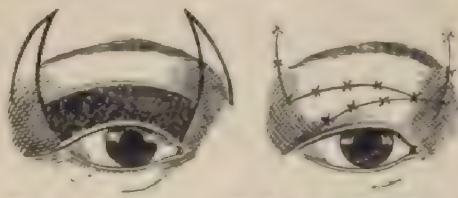


Fig. 46.—Rollet's method of blepharoplasty (upper lid) (Ophthalmoscope, Feb., 1904).

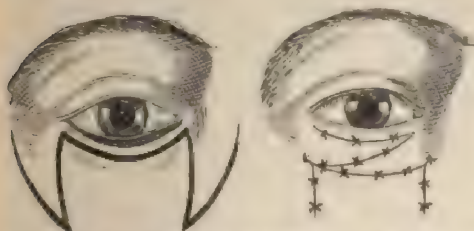


Fig. 47.—Rollet's method of blepharoplasty (lower lid) (Ophthalmoscope, Feb., 1904).

planted in the middle of this cicatricial surface. The flaps are next to be cut as shown in Fig. 46. For the upper lid a nasofrontal flap, commencing under the supero-internal angle of the orbit, is shaped with the bistoury, the knife going down to the bone at the first incision.

The flap is shaped like a

half-slice of melon, with the concavity turned toward the temple. A second flap, temporofrontal and symmetric with the first, is cut with its base below the temporoexternal angle of the orbit. Its concavity is turned toward the nasal side. These two flaps are dissected, bent over, and placed in position, the first outward and downward, the second inward and downward. They are superimposed and sutured with fine metallic thread (annealed iron thread). The sutures at the apexes of

¹ Abstr. Amer. Med., Aug. 13, 1904.

² Ophthalmoscope, May, 1904.

³ Ophthalmoscope, Feb., 1904.

the flaps are inserted first. The sutures are removed on the fifth day. For the lower lid (see Fig. 47) a falciform flap next the nose and then a malar flap are made, these forming half-crescent-like strips the concavity of which is turned toward a vertical dropped from the middle of the eyeball. They are then dissected, adjusted, and sutured as in the foregoing.

Ptosis Operations.—N. Bishop Harman¹ (Cambridge, Eng.) has devised a modification of Mules's operation, substituting a fine chain (similar to that frequently used for the suspension of eye-glasses, pendants, etc., and known to the trade as "wove chain") for the wire commonly employed in this operation (Fig. 48). The only instruments required are the chain and a 4-inch needle with a triangular cutting-point. The chain may be attached to the needle by uniting the two by a small soldered link in such a fashion that the end link of the chain is welded into the eye of the needle, or if the chain is cut with seissors and the loose fragments of wire removed, a couple of loops will be noticed projecting freely from the end; these can be dilated by passing through them an ordinary fine domestic needle or pin; a strong fine silk suture

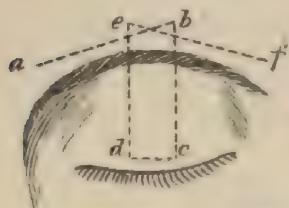


Fig. 48.—Harman's operation for ptosis (Brit. Med. Jour., Sept. 26, 1903).

is now threaded through both loops, and the two ends of the silk suture are passed from opposite sides through the eye of the needle. Inserting the chain-needle above the internal angular process at *a*, it is passed outward and with a slightly upward inclination deeply beneath the tissues to the forehead, to be withdrawn at *b*; as much of the chain is drawn through as desired. The needle is reinserted at *b*, passed beneath the brow close to the orbital margin, and through the tissues of the lid to *c*, where it is withdrawn and the chain after it. It is then passed in a similar manner from *c* to *d* through the substance of the tarsus and withdrawn. It is now returned from *d* to *c* above the brow, and withdrawn, and a final length embedded above the brow from *e* to *f*, which is just above the external angular process. By traction on the free ends of the chain at *e* and *f* the lid can be raised to the degree desired, or this adjustment can be left until the day succeeding the operation. The free ends of the chain should be turned toward each other over the skin of the brow and cemented in position by a cotton-wool and collodion dressing. The free ends at *e* and *f* are cut off later and the extremities of the chain pushed beneath the skin (see Fig. 48).

Operations in Syphilitic Cases.—B. Sacks,² before the New York Neurological Society, in considering acquired ptosis, emphasized the point that after a certain length of time, when the ordinary therapeutic procedures had failed to bring about a favorable result, it was proper to resort to surgical means, and that if there was a diplopia, other ocular muscles should be cut hereafter and a proper equilibrium of the muscles restored.

¹ Brit. Med. Jour., Sept. 26, 1903.

² Med. News, Feb. 13, 1904.

He has followed this course in a number of stubborn syphilitic cases with satisfactory results, and recommends operation not only in ptosis, but in any other ocular palsies of long duration.

LACRIMAL APPARATUS.

Anatomy of the Lacrimal Apparatus.—Halben,¹ by a series of studies, demonstrates that the entire passage from the punctum to the beginning of the nasal canal is enveloped in firm elastic fibers which are most numerous and thick about the punctum. He also shows that the punctums are surrounded by muscular fiber so arranged as to form a quadrangular sphincter. A highly developed pavement epithelium and an enveloping longitudinal muscular layer are found in the canaliculi in addition to the elastic coat, but there is no submucosa. In the tear-sac there are two or more layers of cylindric epithelium separated from the elastic layer by adenoid tissue. Santos Fernandez² (Havana) explains the infrequency of lacrimal disease in negroes by the fact that the nasal duct is wider, shorter, and more rectilinear than in the whites, in whom it is long and tortuous.

Bilateral Enlargement of the Lacrimal Glands.—W. T. Shoemaker³ (Philadelphia) reports a case of this character occurring in a colored girl, 19 years of age. The duration was about 5 years. There were marked enlargement of both upper lids and complete ptosis on the right side. The eyeballs presented no abnormality externally or ophthalmoscopically, and their movements were free and full in all directions. A profound simple anemia was present. This observer accredits the lacrimal condition to systemic disturbance, which seems to be favored by the presence of the anemia.

Spontaneous Prolapse of Both Lacrimal Glands.—D. Roy⁴ (Atlanta, Ga.) reports a case of this interesting anomaly occurring in an unmarried colored woman, 27 years of age, following an attack of bronchitis. There was no history of traumatism. Both eyelids were apparently swollen and edematous, especially toward the temporal side. Palpation served to detect a well-defined, freely movable, glandular body just beneath the border and at the outer edge of the supraorbital ridge. Pain and visual disturbances were absent. Patient declined operative interference as the condition was giving no trouble to her. The lacrimal function was unimpaired.

Ligation of the Canaliculi to Prevent Infection Following Cataract Extraction.—A. Quackenboss⁵ (Boston) inserts a probe into each punctum and ligates the corresponding canal before proceeding to cataract-extraction in cases in which there is lacrimal disease. The ligatures are removed at the end of 2 weeks. He justly accredits F. Buller with devising this operation. (*Vide* YEAR-BOOK, 1904, vol. ii, p. 536.)

New Method of Treatment for Lacrimal Stricture.—J. Wilkinson

¹ Von Graefe's Arch. f. Ophthal., lvii, Heft 1. ² Recueil d'Ophthal., Sept., 1903.

³ Ann. of Ophthal., July, 1904.

⁴ Am. Jour. Med. Sci., Jan., 1904.

⁵ Boston M. and S. Jour., Mar. 31, 1904.

Jervey¹ (Greenville, S. C.) discards the dilation of the nasal duct [not lacrimal duct, as many insist on terming it] by means of Bowman's or Theobald's probes, but instead uses the instrument shown in the illustration (Fig. 49). The principle of the instrument is simply that of a wire bent double upon itself. When traction is made upon one free end, by turning the thumb-screw, the other being held firm, a buckling results which accomplishes dilation. Syringing may be performed during dilation. The instrument is provided with a sliding collar which can be

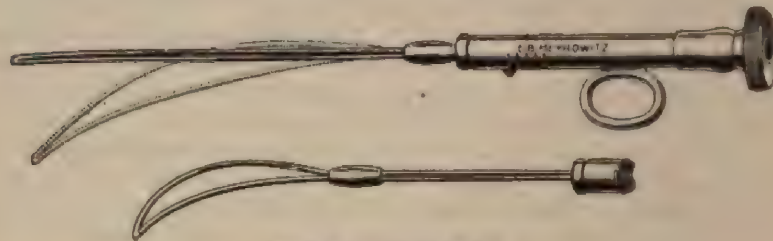


Fig. 49. —Jervey's dilator.

pushed down to the punctum in those cases in which splitting is necessary, so preventing the possibility of rupturing the punctum or canaliculus in the process of dilating the remainder of the canal. He precedes the introduction of the instrument by the instillation of cocaine and adrenalin, and if the canaliculus will not permit the passage of a No. 1 or 2 Bowman probe, it is incised for about 2 mm., and if this is unsuccessful, it is slit in the usual way.

Radical Treatment of Dacryocystitis.—E. F. Snyder² (Chicago) determines whether a case is suitable for conservative treatment by attempting to inject fluid from the sac into the nose; if the fluid fails to pass and a bony or cicatricial stricture is detected by a fine sound, he considers this an indication for extirpation of the lacrimal sac. As other indications he mentions failure of a long course of conservative treatment; inability on the part of the patient to be treated conservatively; distention and atonicity of the sac, tuberculosis, or lupus, and operations on the eyeball. A. Wiener³ (New York) gives the following indications: (1) In fistula of the lacrimal sac after long-continued suppuration (acute cases excepted). (2) In chronic blepharorrhea of the sac, with or without ectasia. (3) In chronic catarrh of the sac with an organic stricture. (4) In chronic blepharorrhea when disease of the bone with caries is present. (5) In relatively fresh cases of blepharorrhea, under the following conditions: (a) In *ulcus serpens* when the healing is very much favored by an immediate extirpation of the sac; (b) when an operation for cataract or glaucoma is contemplated; (c) in fresh injuries of the cornea. (6) Tuberculosis of the sac.

¹ Med. Rec., Dec., 1903.

² Chicago Med. Recorder, Oct. 15, 1903.

³ Med. Rec., Apr. 2, 1904.

CONJUNCTIVA.

Vernal Conjunctivitis.—Swan M. Burnett¹ (Washington, D. C.), in a consideration of this affection in negros, remarks several important distinguishing features of the disease, chief among which is the fact that circumcorneal hypertrophy, as he prefers to call it, is not destructive. The affection occurs both on the bulbar and on the palpebral conjunctiva. He believes both forms exist together. There is never an involvement of the cornea aside from the hypertrophy. Intense itching and burning sensations are the characteristic subjective symptoms. The elevations at the base of the cornea are dirty gray in appearance and bear no resemblance to any other pathologic condition found there. The palpebral aperture has a dull, soggy look and a dusty appearance, as though it had been smoked. In the section of country surrounding Washington, D. C., the negro is more prone to the disease than the whites. Sex has no influence on the frequency of the disease. It is more common in children than in adults. He also observes that there is an almost total absence of the affection in Russians, in whom trachoma is so frequent. This, together with the immunity of the negro to trachoma and his susceptibility to circumcorneal hypertrophy, to his mind offers a suggestion as to an antagonistic character in the disease, which, if followed up, might lead to some more definite knowledge of both affections. C. A. Veasey² (Philadelphia) reports a case of monocular spring conjunctivitis, resembling malignant growth of the corneal limbus, in which the course of the affection, subsequent to the removal of the growth, showed that the condition was spring conjunctivitis and not alveolar sarcoma, as at first supposed. Veasey's conclusion that the clinical history must always be given consideration in the establishment of a diagnosis from the study of a microscopic specimen is generally accepted, but such a condition of affairs is to be deplored, since it lessens the value of microscopic examinations for diagnostic purposes. If the clinical features constitute the balance, why seek further? Another very pertinent criticism naturally arises in connection with this case: Why confound vernal conjunctivitis with malignant growth, since the former tends at all times to hypertrophy and is never destructive in character?—a distinguishing feature demonstrated long ago by Swan Burnett and others.

Purulent Ophthalmia.—M. Standish³ (Boston, Mass.), in the treatment of purulent ophthalmia, prefers gentle but thorough cleansing of the lids and conjunctiva with boric-acid solution and the local application of the less irritating silver salts, especially protargol and argyrol. He believes that protargol is the more valuable when there is corneal involvement. He sees no indication for the employment of cold in any stage of the disease, and believes it to be harmful, particularly in the stage of swelling.

Traveling Ophthalmic Hospital in Egypt.—Through the philanthropy of Sir Ernest Cassel in 1903,⁴ who placed at the disposal of the

¹ Am. Jour. Med. Sci., Feb., 1904.

² Am. Jour. Med. Sci., May, 1904.

³ Abstr. Amer. Med., June 11, 1904.

⁴ Jour. Am. Med. Assoc., May 28, 1904.

Egyptian Government \$200,000 to be used for the benefit of sufferers from diseases of the eye, the Egyptian Sanitary Department established a traveling hospital under the direction of A. F. MacCallan, formerly of the London Ophthalmic Hospital. The hospital was recently near the town of Menouf, in the west of the Nile Delta. It consisted of 8 Indian tents and kitchen of sun-dried bricks. The largest tent was used for operations, of which on an average 6 were performed daily; about five-sixths of the total were for entropion (trichiasis). There were 2 tents for the accommodation of in-patients, only the most severe cases, especially those requiring intraocular treatment operations, being admitted. In another tent out-patients were treated by Mr. MacCallan's Arab assistant, who was trained in Cairo. Including this assistant, the staff of nurses and servants consisted of 10 persons. The hospital was organized for the purpose of extending treatment to those to whom it would otherwise be denied on account of the great distance from other hospitals. It was largely attended by the natives.

Epidemic Trachoma.—Concerning a recent epidemic of trachoma among school-children, E. M. Alger¹ (New York) states that the condition was really one of follicular conjunctivitis which resembled trachoma only in the occurrence of soft granulations. He says there was absolutely no evidence of contagion that would not apply equally well to heat-prostration or to enteritis. Alger believes that atmospheric dirt must play a very large part in its etiology. In most cases the glands in the neck are enlarged, and it is well known that this class of children have a disproportionate number of adenoid growths in the pharynx. The granulations usually disappear completely in a few weeks' time under the simplest kind of treatment.

Parinaud's Infective Conjunctivitis.—Chaillous² adds 5 cases to the list of those previously reported, making in all 20 cases of this disease on record. From an extensive study of these cases he concludes that this disease is a distinct conjunctival affection, characterized by colored vegetations, variable in size and shape, and most often unilateral. Erosion or even ulceration of the conjunctiva may accompany these vegetations, and in all cases enlargement of the preauricular and cervical glands has been noted. Suppuration of the glands sometimes occurs. The conjunctival affection tends toward cure, but the glandular enlargement persists after the conjunctivitis has subsided. The disease resembles tuberculosis in its clinical features, but is not due to the same micro-organism. F. H. Verhoeff and G. S. Derby³ have reported a case terminating in recovery. From a very careful bacteriologic and histologic examination they conclude as follows: The lesion consists essentially of marked cell-neerosis in the subconjunctival tissue, with extensive infiltration of the latter with lymphoid and phagocytic epithelioid cells. This is accompanied by chronic inflammatory reaction of the deeper tissue, leading to the process of organization and the production of new fibrous tissue. The agent which produces the local lesion is nonpyogenic,

¹ N. Y. Med. Jour., Apr. 9, 1904.

² Ann. d'Oculistique, Jan., 1904.

³ Arch. of Ophthalm., July, 1904.

suppuration, when it does occur, probably being due to a secondary infection. The infection is, in all probability, not due to any of the known microorganisms. The most efficient treatment consists in the early and repeated excision of the polypoid vegetations.

Conjunctivitis Induced by Influenza Bacillus.—Zur M. Nedden¹ found the influenza bacillus in 13 cases of conjunctivitis, the symptoms being those of acute conjunctivitis with an abundant discharge of a thin, fluid or flaky secretion. In nearly all these cases the bacillus was found in pure culture. He does not consider the influenza bacillus to be identical with the Koch-Weeks' bacillus, but concedes that they may belong to the same group. He believes that the trachoma bacillus of Müller is an influenza bacillus.

Pemphigus of the Conjunctiva with Consequent Total Ankyloblepharon.—P. Cohn² gives an account of a case of pemphigus of the conjunctiva in a Russian child, 11 years of age. The pemphigus blebs were also observed upon the buttocks, cheeks, lips, eyelids, and scalp. The right palpebral fissure was wholly obliterated by adhesion of the lids one to the other; the condition of the left palpebral fissure was not so marked. The lower palpebral conjunctiva showed small ulcerated areas, evidently the remains of previous blebs. Operation was performed for the relief of the ankyloblepharon, with a successful result. Bouvin³ also records a recent case of conjunctival pemphigus. W. Anderson,⁴ before the Ophthalmological Society of the United Kingdom, showed a case of bilateral pemphigus of the conjunctiva in a woman, 29 years of age, in which the shrinking of the conjunctiva was marked and the ocular movements greatly limited. A cystic swelling, probably due to retention of the tears, was observed above the right outer canthus. A cutaneous eruption was also present.

Pemphigus of the Conjunctiva with Fatal Termination.—S. H. Brown⁵ (Philadelphia) reports a case of pemphigus in a woman, 48 years of age, attacking the mucous membrane of the eye as well as the skin. The ocular affection resulted in almost total symblepharon and corneal ulceration. The disease showed no tendency toward recovery, and the patient died of exhaustion 6 months after the first appearance of the blebs.

Papilloma of the Limbus Conjunctivæ.—G. H. Heilmüller⁶ (Washington) describes a case of this character the duration of which was approximately 10 months. The accompanying illustration (Fig. 50) shows the life-size appearance of the growth. It was excised and examined. The microscope revealed a typical wart structure—*i. e.*, vascular papillas covered by epithelium without tendency to infiltration of underlying parts by epithelial cells.

Epithelial Cystoma of the Conjunctiva (Dermoeptelioma of Parinaud).—E. T. Oatman⁷ (New York) reports a case, occurring in a

¹ *Klin. Monatsbl. f. Augenheilk.*, 1903, Bd. i, p. 269.

² *Zeit. f. Augenheilk.*, Nov., 1903.

³ *Ned. Tijdschrift v. Geneeskunde*, 1903, No. 17. ⁴ *Ophthal. Rev.*, Feb., 1904.

⁵ *Ann. of Ophthal.*, July, 1904. ⁶ *Jour. Am. Med. Assoc.*, Aug. 8, 1903.

⁷ *Arch. of Ophthal.*, 1904, vol. xxxiii, No. 2.

boy, 17 years of age, of a smooth, freely movable, painless, semitranslucent, reddish-yellow tumor having a vertical diameter of 5 mm. and a horizontal diameter of 10 mm., situated on the scleral conjunctiva between the cornea and inner canthus, which on histologic examination presented the features shown in the accompanying illustrations (Plate 9). The illustrations were made from photomicrographs by Oatman. The manner in which these cysts are formed seems to be somewhat obscure, but this observer thinks that the evidence at hand renders it

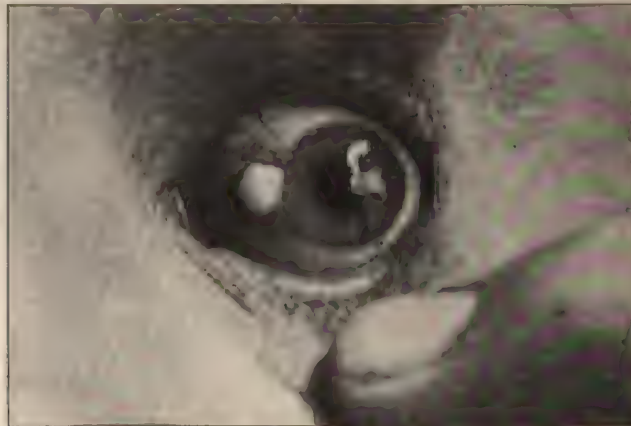


Fig. 50.—Heilmuller's case of papilloma of the conjunctiva (Jour. Am. Med. Assoc., Aug. 8, 1903).

probable that the pathologic process is primarily caused by inflammation, or some similar tissue action, produced in a crypt, follicle, or fold of the conjunctiva by some extraneous or systemic irritation. If the deep epithelium of such crypts is thereby excluded from communicating with the surface, the subsequent cell-proliferation and degeneration may result in cyst-formation. He suggests "epithelial cystoma of the conjunctiva" as a preferable title for tumors of this character.

CORNEA.

Interstitial Keratitis and Its Relation to Injury.—H. W. Dodd¹ (London) cites 3 cases in which interstitial keratitis was precipitated by trivial injury to the cornea. The patients were all young men and showed undoubted evidences of congenital syphilis. In each a superficial injury of the cornea was sufficient to start up double interstitial keratitis of the usual type.

Ichthyol in Keratitis.—V. Salvo² speaks favorably of the use of ichthyol prepared with equal parts of glycerin and water in the various forms of keratitis, especially in the presence of ulceration. It should

¹ Ophthalmoscope, May, 1904.

² *Annali di Ottalmologia*, 1903, xlii, Nos. 7, 8, p. 519.

PLATE 9.

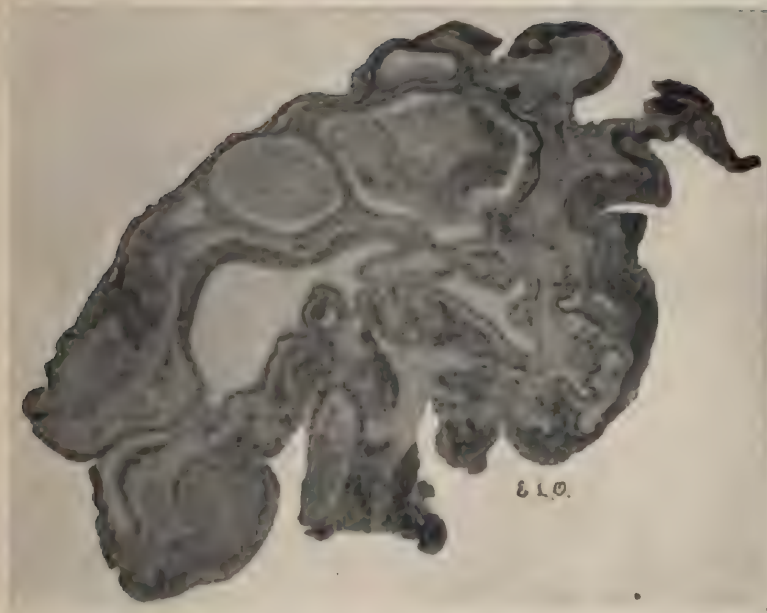


Fig. 1.—Multilocular cyst. Epithelial cystoma of the conjunctiva. $\times 75$ (Oatman, in Arch. of Ophthal., vol. xxxiii, No. 2, 1904).

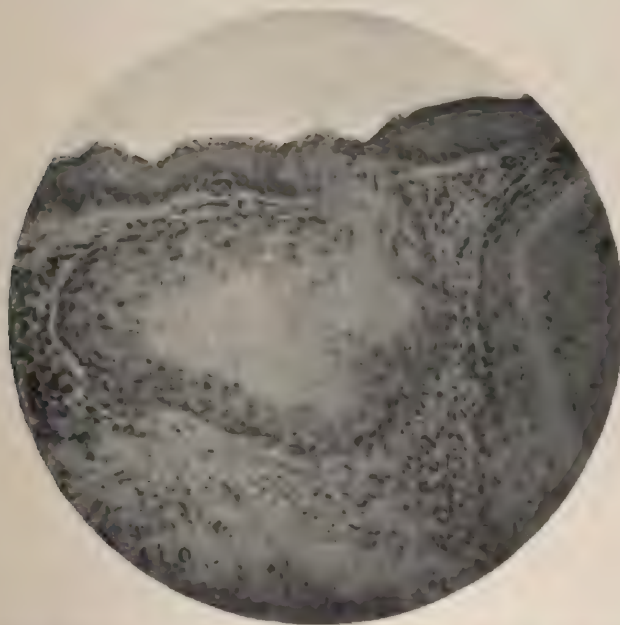


Fig. 2.—Young cyst formed by degeneration of the central cells of an ingrowing crypt (Oatman, in Arch. of Ophthal., vol. xxxiii, No. 2, 1904).

be applied once daily to the everted lids by means of a brush. By its antiseptic properties it combats the cause of the ulcer, and by the absence of irritating properties allows the ulcer to pursue a natural course toward recovery. The vasoconstricting action of the drug promotes the process of repair.

Latticed Corneal Opacities.—H. Freund¹ describes 15 cases of this rare disease occurring in two families: it varied in intensity in each case, depending upon the length of time it existed. He finds that the disease always begins after puberty and affects both eyes, but usually one eye more than the other. Usually an active keratitis arises toward the latter years of the affection, and the corneal epithelium degenerates. The peripheral part of the cornea never becomes affected by the disease, therefore an iridectomy in the latter stages often improves vision considerably. The disease occurs in families and is hereditary.

Corneal Ulcers.—W. T. Phillips² (Buffalo, N. Y.) employs suprarenal extract and chloreto-ne together with nuclein (5 per cent solution, such as is used for hypodermatic medication) in the treatment of corneal ulcers. Boric-acid solution is used to antisepticize the conjunctival sac. He advises attention to the general condition of the patient and measures directed toward nasal caries, adenoids, hypertrophies of the turbinata, or other similar affections that may coexist with the corneal ulceration.

Hot Water in the Treatment of Corneal Affections.—Manolesco³ experimented with the action of hot water in deep infiltrations of the cornea, especially in parenchymatous keratitis. His method consisted in cocainizing the eye and then allowing hot water (80° to 90° C.) to fall drop by drop on the cornea for about 5 to 10 minutes twice daily. The temperature of the lower culdesac is raised about 1°, circumcorneal injection is increased, and corneal vascularity becomes more apparent. This reaction lasts from 2 to 5 hours. From 12 cases so treated he concludes that this method is superior to other local treatments in parenchymatous keratitis.

Lippincott⁴ (Pittsburg, Pa.) cauterizes the cornea in these cases by means of actively boiling water, dropping it on the ulcerated area with a small pipet.

Corneal Ulceration Due to *Bacillus Pyocyaneus*.—A. McNab⁵ relates the history of a case in which almost the entire cornea was occupied with a round ulcer, and the conjunctiva was edematous and covered with a greenish, purulent secretion. An extensive hypopyon was present. Cultures and animal inoculation showed the presence of a pure culture of *Bacillus pyocyaneus*.

Hypopyon Ulcer Caused by *Bacillus Coli*.—D. de Bernardinis⁶ (Naples) relates the history of a case in which a severe hypopyon ulcer followed an injury caused by a splinter. Inoculation was required 5 days after the examination. Bacteriologic examination showed a *Bacillus* whose form, growth, and other characteristics were identical to the specific

¹ Arch. f. Ophth., 1900, vol. 37, p. 277. ² N. Y. Med. Jour., Oct. 3, 1904.

³ Ann. Ocul., 1904, vol. 23, p. 124. ⁴ Trans. N. Y. Med. Soc., June, 1904.

⁵ Ophth., 1904, vol. 41, p. 124. ⁶ Gazz. med. Ital., 1904, vol. xxxi.

agglutination test proved it to be the *Bacillus coli*. When introduced into rabbits' eyes, it produced changes analogous to those in the patient's eye. De Bernardinis contends that the hypopyon in cases of septic ulcer is not due to rupture of a posterior abscess into the anterior chamber, but is the result of inflammatory reaction of the iris and ciliary body.

Patchy Corneal Degeneration.—Fehr¹ describes cases of this condition occurring in 3 healthy members of the same family. The malady was identical in each and consisted in a gradual blurring of the cornea, starting at the age of 10 or 12 years and eventually destroying the usefulness of the eye. To the naked eye, the cornea had a grayish color, interspersed with white spots and patches of various shapes. With a powerful lens the diffuse white thickening was seen to consist of fine dots. The opacities were central and situated in the superficial layers. The cause was undetected and treatment was of no avail. He believes these cases may be considered as varieties of patchy keratitis due to degenerative changes.

Papilloma of the Cornea.—D. H. Coover² (Denver) cites a case of this character having its origin apparently in a cicatrix at the outer margin of the cornea, following the removal of a supposed pterygium. The growth was removed and subjected to a microscopic examination which served to confirm the diagnosis of papilloma.

Conic Cornea.—G. G. Lewis³ (Syracuse, N. Y.) describes in detail the technic of cauterizing the apex of the cone by the galvanocautery, a method of treatment he believes to be most generally employed in this condition. Atropin is used to dilate the pupil and cocain is instilled to anesthetize the cornea. If the resulting eschar is extensive, an artificial pupil may be necessary, and when the cornea is not too thin, tattooing may also be performed. A. S. Morton⁴ (London) tabulates his experiences with 13 cases of conic cornea treated by surgical means—cautery, excision of apex, and iridectomy. In all but one case there was noticeable improvement of vision. L. W. Fox⁵ (Philadelphia) describes a new **nonoperative method** of improving the vision in conic cornea which is an elaboration of the system devised by Nottingham. The method consists in having the patient, at varying intervals, select from a series of plane lenses in which the corneal area is screened by black patches of different size and shape containing the requisite slits, that which gives best vision when combined with the correcting lens. The method is entirely subjective, and, owing to the fact that the refraction of the cornea varies from time to time, frequent examinations are necessary. His experience with this method has been highly gratifying.

IRIS.

Argyll-Robertson Pupil.—J. M. Clarke⁶ (Bristol, Eng.), from an extensive study of this phenomenon, reaches the conclusion that previous

¹ Zent. f. prak. Augenheilk., Jan., 1904.

² Buffalo Med. Jour., Jan., 1904.

³ Ophthal. Rec., Jan., 1904.

⁴ Ophthal. Rec., Oct., 1903.

⁵ Brit. Med. Jour., Sept. 26, 1903.

⁶ Brit. Med. Jour., Dec. 26, 1903.

syphilitic affections do not seem to be sufficient to produce it without some further change. He thinks that it is an evidence of further degenerative processes at work within the nervous system. It does not necessarily occur with the ordinary visceral lesions of the disease. This degenerative process is to be regarded in most cases as parasyphilitic, though in a certain proportion proof may be wanting and there is possibly some other unknown cause. It may remain stationary at the early stage without further development for a long period. Marburg¹ reviews the various opinions concerning the well-known Argyll-Robertson pupil—loss of action to light stimulus but response to convergence. In regard to its origin he discards the theories of location in the spinal cord and ciliary ganglion and places the center for light reflex in the midbrain, in the neighborhood of the nucleus of the iris-sphincter. The principal cause of the phenomenon is syphilis, and the chief diseases in which it is met are locomotor ataxia, general paralysis, and cerebral syphilis. It may result from injury, or it may be a temporary symptom in numerous diseases, the principal of which are the various neuroses, and the infections, particularly meningitis, influenza, and pneumonia. It may also follow poisoning by atropin, carbon disulfid, lead, the bromids, malefern, poisonous fungi, tobacco, and alcohol. Marburg calls especial attention to the fact that the light reflex is not lost in affections of the posterior column occurring in pernicious anemia. In patients with the Argyll-Robertson pupil in which a history of syphilis is denied close inspection will generally reveal aortic degeneration or other sign of preëxisting lues. Jas. G. Kiernan² states that the Argyll-Robertson pupil exceptionally occurs in many conditions, having been temporarily noted after railroad accidents and other shocks, in cases in which no subsequent evidence of grave neuroses had occurred. In such cases it disappears. Exceptionally it has been found in alcoholism. It occurs early in locomotor ataxia, in parietic dementia, and in constitutional syphilis. But constitutional syphilis occurs quite often in which it is absent. It is frequent in parasyphiloses, but it is not to be taken as a pathognomonic mark of these conditions, since it has been found in conditions like alcoholism, and therefore may be a temporary expression of toxic states occurring during constitutional syphilis.

Unusual Condition of the Iris.—F. W. Marlow³ (Syracuse, N. Y.) details a remarkable congenital condition of the iris in a girl, 17 years of age, possessing a physiognomy of inherited syphilis, but lacking any definite features of this disease. In the right eye there was almost complete destruction of the iris from its ciliary attachment up to the outer margin of the sphincter pupillæ, which appeared to remain intact in this eye, with the exception of the inner portion of the iris and one narrow strand of tissue running from the outer margin of the sphincter to the lower-outer angle of the anterior chamber. The pupil itself was displaced upward and slightly inward to a point just within the margin of the cornea, where its true nature was less obvious and less easily

¹ Wien. Klin., Aug., 1903.

² Med. News, Mar. 19, 1904.

³ Ophthalmoscope, June, 1904.

recognized. Reaction to light was easily observed, and scopolamin produced an enlargement mainly in the long axis of the oval. In the left eye the destruction involved the sphincter pupillæ as well as the radiating portion of the iris. The fundus in each eye was normal. The sister of this patient, on ophthalmoscopic examination, presented evidences of choroidal atrophy and an elevated (?) cystic or locally detached condition of the retina, apparently congenital.

Primary Unpigmented Sarcoma of the Iris.—A. Alt and L. R. Culbertson¹ record a case of this character occurring in a farmer, 72 years of age. The patient complained of failing vision in the left eye, and stated he had noticed a spot or growth in the iris of this eye for about one year. Careful inspection led to the diagnosis of sarcoma, which was confirmed later by the microscope after enucleation.

Nontraumatic Serous Cyst of the Iris.—T. R. Pooley² (New York) describes a case of serous cyst of spontaneous origin occurring in the iris of a man, 34 years of age. The duration of the condition was 12 years, and it had been mistaken for rupture of the iris. The cyst was removed under cocain, and the tissue subjected to microscopic examination which showed only rarefied iris tissue. The tumor measured 5 mm. in both diameters, was somewhat globular in form, and flattened against the cornea. It had produced no irritation or visual disturbances.

Air Injections in Tubercular Iritis.—C. W. Heath,³ in the treatment of a case of tubercular iritis, injected air into the anterior chamber. The following day there was very little reaction and the air introduced was two-thirds absorbed, and on the following day only a small bubble remained. The operation was repeated at weekly intervals until 4 injections had been made, with negative results. The growths continued to increase uninterruptedly. Heath's conclusion is that in cases of tuberculous iritis, in which the lesion is well established, air-injections will not effect a cure.

CHOROID.

Choroidal inflammation caused by excessive use of the eyes is reported by D. B. St. John Roosa⁴ (New York). The patient was a physician, and while attending an obstetric case, he was obliged to wait for a period of 12 hours, the major portion of which he passed away in reading. The following morning vision was blurred. Six weeks later he consulted Roosa, who observed considerable haziness of the vitreous, on the subsidence of which were seen patches of choroidal atrophy in the right eye. The visual disturbance persisted.

Carcinoma of Choroid Metastatic from the Prostate.—A. Greenwood⁵ (Boston) records a case of a man, aged 56, suffering from carcinoma of the prostate, who suddenly developed acute glaucoma and retinal separation in the left eye. The patient eventually died, and

¹ Am. Jour. of Ophthal., Feb., 1904.

² Am. Jour. of Ophthal., Mar., 1904.

³ Ophthal. Rec., May, 1904.

⁴ Med. Rec., Feb. 20, 1904.

⁵ Boston M. and S. Jour., Sept. 10, 1903.

autopsy showed a growth of the left eye which on section proved to be carcinoma of the choroid.

LENS.

Cataract Extraction with a Small Peripheral Button-hole in the Iris.—H. B. Chandler,¹ in 312 extractions in patients over 40 years of age, removed a round piece of the iris, 1 mm. in diameter, as near its root as possible. In making this small opening it is absolutely necessary to have a forceps the teeth of which are at the tip end, and scissors whose blades are very thin; otherwise it will be made larger and further down than intended. This allows drainage and expression of cortical material. As a result of this method he had only 3 cases of loss of vitreous, and 1 of these occurred in attempting to remove an opaque capsule. He usually made the opening after having extracted the lens.

Extraction of Cataract in Capsule.—H. Smith² (Jallundhar, Punjab, India), in advocating this operation, gives the following table of his recent results:

Table of Results of Cases Submitted to Extraction in the Capsule at Jallundhar Civil Hospital from January 1 to May 1, 1903.

| NUMBER. | IRITIS. | ESCAPE OF VITREOUS. | CAPSULE BURSTING. | CAPSULE LEFT BEHIND. | FIRST-CLASS RESULTS. | SECOND-CLASS RESULTS. | THIRD-CLASS RESULTS. |
|---------|---------|---------------------|-------------------|----------------------|----------------------|-----------------------|----------------------|
| 1023 | 0.19 % | 6.6 % | 8 % | 4 % | 99.42 % | 0.19 % | 0.39 % |

RETINA.

A New Membrane in the Eye.—F. H. Verhoeff⁴ (Boston), in a section of a normal eye, found a previously undescribed fenestrated membrane in the pigment layer of the retina identical in structure and staining reactions with the membrana limitans externa. He believes that this new membrane is a product of the cells which project through it, and that the membrana limitans externa has a similar origin, arising from the cells that eventually become rods and cones. His deduction from these studies is that the rods and cones and the cells of the pigment layer are essentially of the same nature, and that the former are only modified spongioblasts of His. In sections of glioma the membrane in the rosetts was found to be identical with the fenestrated membrane in the pigment layer and the external limiting membrane. The fenestrated structure of the membrane seemed to explain the formation of the rosetts, for when a few cells became bound together by such a membrane and they were unhampered in their growth, they would be compelled to form a more or less spheric body.

¹ Arch. of Ophthal., Jan., 1904.

² Brit. Med. Jour., Sept. 26, 1903.

³ Occurred in cases where the capsule was left behind.

⁴ Boston M. and S. Jour., Oct. 22, 1903.

The Position of the Center of the Macula Lutea in the Human Brain.—L. Laqueur¹ describes in detail a number of cases which to his mind prove that the cerebral center of the macula lutea is in the most posterior part of the fissura calcarina, very near the point of the occipital lobe.

Fundus Anomalies.—C. H. Beard² (Chicago) has reported a series of observations concerning a hitherto undescribed appearance of the optic-nerve entrance, particularly as regards the arrangement of the nerve-fibers and that of the bloodvessels of the retina. He mentioned especially the whitish crescent occurring on the nasal side of the disk, often crossed by vessels, and applied the term "morning-glory nerve-head" to this condition. Various anomalies and anastomoses of the arterial supply were considered, as was also torsion of the eyeground toward the temporal side, with no evidences of imperfect closure of the fetal cleft elsewhere, occurring in these cases. He had noticed the



Fig. 51.—Duane's case of aplasia of the papilla and retinal vessels; right eye (erect image) (Arch. of Ophthalm., 1903, vol. xxxii, No. 4).

prevalence of errors of refraction on the side having the defect. He believed this anomalous condition to be due to an imperforate lamina cribrosa.

Aplasia of the papilla and retinal vessels, with a peculiar anomaly at the macula in eyes otherwise normal is reported by A. Duane³ (New York) as occurring in a boy, aged 2½ years, who was brought to him with the complaint that since the patient was 3 months old he had never seemed to see anything. Apart from the ocular condition the patient was normal. Examination showed nystagmus, absence of light-perception, absence of pupillary reaction to light, vitreous opacities in the left eye, and fundus changes as depicted by the accompanying illustrations (Figs. 51, 52).

¹ Virchow's Arch., 175, 3.

² Abstr. Amer. Med., July 30, 1904.

³ Arch. of Ophthalm., 1903, vol. xxxii, No. 4.

Contraction of the Visual Fields as a Symptom of Anesthesia of the Retina in Children.—L. W. Fox¹ (Philadelphia) gave the histories of 24 cases of children between the ages of 8 and 16 years, in whom loss of vision with contraction of the visual fields occurred without other subjective or objective symptoms. The application of the constant electric current from 3 to 5 times served to bring about a restoration to normal. In only one case was there a recurrence. The eye-grounds were normal in every respect, and the patients were in good physical condition. The essayist was convinced that the affection was not hysteric in nature, since there were no scotomas, inversion of the color-fields, or any of the concomitant symptoms of hysteria. The affection, in his opinion, was due to fatigue and exhaustion of the retina, brought on, in all probability, by mental overwork in school.



Fig. 52.—Duane's case of aphaia of the papilla and retinal vessels; left eye (erect image) (*Arch. of Ophthalm.*, 1903, vol. xxvii, No. 4).

Obstruction of the Central Retinal Artery.—W. T. Shoemaker² (Philadelphia) gives an account of a case which he believes to be one of lateral thrombosis of the central artery of the retina. The patient was a girl, 17 years of age, who was stricken suddenly blind in the left eye upon returning from a matinee of an emotional melodrama in which the heroine became suddenly blind. In this patient's case everything became black before the affected eye except in the lower field, where vision remained. The attack was neither preceded, accompanied, nor followed by vertigo, headache, or any physical discomfort whatever. Her family and personal history were of the best. A functional heart-murmur was present and the blood was normal. The accompanying illustration shows the fundus changes (Fig. 53).

Surgical Treatment of Chronic Bright's Disease from the Oph-

¹ *Abstr. Amer. Med.*, July 23, 1904.

² *Am. Jour. Med. Sci.*, Apr., 1904.

thalmic Standpoint.—G. F. Suker¹ (Chicago), in a careful study of Bright's disease and its retinal complications in relation to decapsulation of the kidney as a method of treatment, concludes that the operation is positively contraindicated in the presence of albuminuric retinitis and neuroretinitis. The tenure of life of these patients under the best medical care is about 2 years after the recognition of the retinal complication—no matter when the retinitis manifests itself. In 16 cases with retinal involvement in which decapsulation was performed the

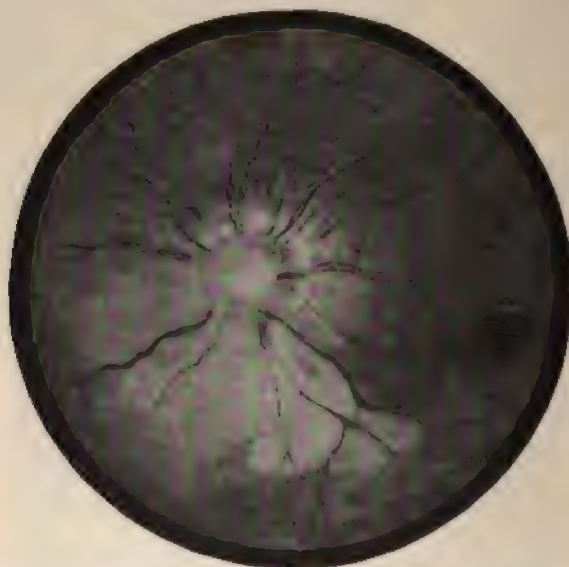


Fig. 53.—Shoemaker's case of obstruction of the central retinal artery, probably lateral thrombus. (Atn. Jour. Med. Sc., Apr., 1904.)

mortality was 100 %, and in not a single case did the patient live even a year after the operation. He therefore reaches the conclusion that medical treatment in cases of nephritis with fundus changes offers as good, if not far better, results than decapsulation in like cases.

Glioma.—C. A. Oliver² (Philadelphia) gives the history of a case of glioma of the retina occurring in a girl, 9½ years old. The eyeball was enucleated, with a rapid and uneventful recovery. The microscope served to confirm the clinical diagnosis. The patient was perfectly healthy 11 years later and had had no recurrence.

OPTIC NERVE.

Ocular Symptoms of Lesions of the Optic Chiasm.—G. E. de Schweinitz and J. T. Carpenter³ (Philadelphia) give the following summary

¹ N. Y. Med. Jour., June 4, 1904.

² Ophthalmoscope, Dec., 1903.

³ Abstr. Amer. Med., July 23, 1904.

of the ocular symptoms of chiasm disease: 1. Anomalies of the visual field—(a) complete bitemporal hemianopsia; (b) temporal hemianopsia of one eye and complete blindness of the opposite eye; (c) bitemporal achromatopsia with central scotoma for colors; (d) central scotomas; (e) irregular losses in the visual field; (f) unilateral nasal hemianopsia followed by progressive loss of the visual field; (g) binasal hemianopsia. 2. Ophthalmoscopic changes—(a) optic neuritis; (b) optic nerve atrophy without preceding neuritis; (c) alterations in the general eyeground. 3. Anomalies of the external ocular muscles. 4. Alterations in the pupil reflexes with special reference to the hemiopic pupillary inaction. The lesions that might produce alteration in the structure and function, according to these observers, are: Newgrowths springing from the body of the sphenoid bone; fracture of the body of the sphenoid; basal, tuberculous, and syphilitic lesions; chronic thickening of the dura mater near the chiasm; vascular disease in the neighborhood of the chiasm; invasion of the chiasm by distention of the infundibulum of the third ventricle in internal hydrocephalus; tumors of the cerebellum and closure of the aqueduct of Sylvius; lesions of the chiasm in disseminated sclerosis.

Optic Neuritis in Acute Infectious Diseases.—Antonelli¹ maintains that all acute general infections are capable of giving rise to optic neuritis, either retrobulbar or papillary. These cases, he states, are much less frequently secondary to meningitis or renal disease than has been supposed. He believes they constitute an instance of true peripheral neuritis analogous to that occurring in other nerves, and that they are produced by toxins, not by microbes. The treatment should, consequently, be directed toward the underlying cause.

Transitory Complete Blindness of Both Eyes.—C. J. Kipp² (Newark, N. J.) records 2 very interesting cases of this character. In the first the condition was associated with more or less frontal headache, but otherwise the patient was in good health. Ophthalmoscopic examination showed bilateral optic neuritis. Total blindness was present, and the pupillary light-reflex was absent. Normal vision was subsequently restored. The treatment consisted in the administration of small doses of potassium iodid. The second case was one of failure of vision in the absence of structural changes or any history as regards the ingestion of toxic substances. The total blindness continued for 36 hours and then the vision gradually returned. The presence of habitual constipation in the patient leads this observer to regard this case as due to intestinal autointoxication. A high enema was given in this case, with an effectual result. Kipp states that in the first case the seat of the affection was in the conducting apparatus, while in the second it was in the optic centers. He doubts whether in either case the treatment had anything to do with the restoration of sight.

Blindness and Oculomotor Palsies from Injuries Apparently not Involving the Optic or Oculomotor Nerve.—Alvin A. Hubbell³ (Buffalo, N. Y.) gives detailed reports of 10 cases of injuries about the head and face,

¹ Arch. d'Optical., July-Oct., 1903.

² Jour. Am. Med. Assoc., Dec. 5, 1903.

³ Abstr. Amer. Med., July 23, 1904.

apparently not implicating the optic or oculomotor nerves, in which blindness or palsy of the ocular muscles followed. He carefully discussed the subject of reflex blindness and reflex paralysis. Hubbell defended the reflex theory as the one that most reasonably with our present knowledge explained the loss of function of the nerves of special sense and of motion in certain cases of remote injury.

Etiology of Tobacco-alcohol Amblyopia.—G. E. de Schweinitz and D. L. Edsall¹ (Philadelphia), with a view to substantiating Horner's statement that neither alcohol nor tobacco, as such, was the direct toxic agent in cases of central amblyopia, but that together these drugs produced chronic gastric catarrh, which in its turn established a chronic anemia of the optic nerve, terminating in the pathologic changes found in this disease, subjected 7 cases to a most thorough clinical examination, including the blood and urine examination. This entire investigation demonstrated, by the results of urinary examination, the presence of disturbances of digestion or of metabolism as a factor in these cases of amblyopia. The correction of the digestive disturbances in these cases by proper diet, in addition to abstinence from tobacco and alcohol, was followed by improvement, thus serving to confirm this view. As the improvement occurred in the vision and digestive tract, the urine likewise improved in quality and hence these observers consider the urine as an indicator of the toxic condition present in these cases and a guide to its treatment.

GLAUCOMA.

Pathology.—K. R. Wahlfors² believes that increase of tension is not essential to glaucoma, but accidental, and that the conception of von Graefe and others in this particular is false. Closure of the channels of exit, he states, may be an important factor in inflammatory glaucoma, but not so in simple glaucoma, in which the tension is quite subordinate or even absent. He insists upon the reduction of the light-sense as a true indication of the nature of the fundamental cause. Hemeralopia may be the first and only symptom present for a long time, and if confined to the periphery, may be overlooked by the patient. The cause of the hemeralopia is functional disturbance of the rods and cones in consequence of imperfect nutrition, the cause of which must lie in the inner layers of the choroid, whose vessels supply the outer layers of the retina. The choroidal lesion is atrophy. The functional disturbances, the sector-like defects of the field, the excavation of the disk, and the increased tension he likewise attributes to this choroidal atrophy. Owing to the choroid being inaccessible to treatment, the prognosis must be unfavorable. This observer thinks that repeated injections of strychnin prevent the spread of the atrophy. In simple glaucoma he states that iridectomy is useless as a curative, but valuable as a prophylactic against acute attacks. Where the tension is increased, iridectomy remains the sovereign means of reducing it. Sclerotomy, both anterior and posterior, as long as the wound is not thoroughly healed, is useful in giving time for the circulatory

¹ Am. Jour. Med. Sci., Aug., 1903.

² Arch. of Ophthal., Nov., 1903.

disturbance to pass off. Eserin reduces tension in fresh cases of acute congestive glaucoma, through causing contraction of the tensor of the choroid and probably of its muscular network. In simple glaucoma eserin is valuable only so long as the atrophic process has not entirely paralyzed the muscular network and the tensor.

Malignant Glaucoma.—W. H. Searles¹ (Oshkosh, Wis.) gives an account of 3 cases of glaucoma in which the instillation of atropin, combined with internal treatment, produced beneficial results. In commenting upon these effects he states that glaucoma occurring coincidentally with the exhibition of atropin arises from a different cause, - namely, obstruction by way of thickening of the iris base,—and that cases charged to the use of atropin can always be quickly cured by the further use of atropin. He believes atropin to be antiglaucomatous, and that the combination, atropin-cocain, reduces volume, blood-supply, secretion, and intraocular tension, soothes pain, improves nutrition, and secures rest, and hence is the logical answer to every glaucomatous process. The sluggish absorption common to glaucoma he combats with fluid extract of jaborandi internally. [In view of the prevailing opinions regarding glaucoma and its relation to cycloplegics, a doubt naturally arises as to the accuracy of this observer's diagnoses.]

Acute Glaucoma Following the Use of Eupthalmin. Henry W. Ring² (New Haven, Conn.) adds a new factor to the etiology of acute glaucoma in the form of the recently discovered mydriatic, eupthalmin. The drug was instilled into the left eye of a woman, aged 56 years, for diagnostic purposes. Fourteen days later, when again observed by Ring, typical glaucoma was present, necessitating an iridectomy. Previous to consulting Ring, however, she had been subject, for a varying period, to paroxysms of severe pain in the left eye and supraorbital region, during which her vision was greatly reduced.

Physiology of the Sympathetic in Relation to the Eye. G. L. de Schweinitz³ (Philadelphia) draws the following conclusions from his review of the entire literature of the subject: The sympathetic should not be considered the nerve of secretion for the lacrimal gland. The dilating impulse to the iris passes from a center in the medulla as far as the second dorsal nerve, following its branch to the cervical sympathetic, and through the long ciliary nerves reaches the muscular tissue of the iris. The weight of evidence favors the ciliary ganglion belonging to the sympathetic. Its removal does not influence intraocular tension. The sympathetic seems to have no relation to accommodation or changes in refraction. Section or extirpation causes a temporary fall of tension. Electric stimulation causes retraction of the ciliary membrane and proptosis. It is followed by contraction of the bloodvessels of the conjunctiva and iris. Stimulation of certain cervical nerves causes pupillary dilation and all the symptoms of stimulation of the cervical sympathetic. Division of the sympathetic at the base of the neck stops the other symptoms, but not the dilation, which is supposed to be due to the

¹ Am. Jour. Ophthalm., May, 1904.

² Med. News, Dec. 1, 1904.

³ Jour. Am. Med. Assoc., Jan. 20, 1904.

inhibition of the tonic action of the third nerve. Miosis is greater after excision of the cervical sympathetic ganglion than after section of the sympathetic cord. The miotic pupil responds to light stimulus, is still further contracted by eserin, and may be dilated by atropin. It is uninfluenced by cocain, which, however, may widen the contracted palpebral fissure. Sympathectomy or gangliectomy may cause increased vascularization of the eye-ground, perhaps ciliary hemorrhages, and alteration in the retinal ganglion-cells.

Influence of Resection of the Cervical Sympathetic Ganglions in Glaucoma.—W. H. Wilder¹ (Chicago) presents a detailed report of 7 cases of sympathectomy still under observation in his own practice. In all the specimens there was increased pigmentation of the ganglion-cells. In 2, mast cells were seen. In 3, the cells were not round, but irregular. In 1, cells slightly vacuolated were seen. In 2 they showed eccentric nuclei and marked vascularity was present. He also gives abbreviated records of 68 operations done on 54 cases by others. Of 38 operations for simple glaucoma, 14 gave no improvement whatsoever, 5 improved for 15 days to 8 months, but had recurrent attacks necessitating iridectomy or caused loss of the eye; 15 improved from 2 months to 2 years. Of these, 3 were stationary, 1 died, 6 remained unimproved after iridectomy, but improved after sympathectomy. Of the 16 operations for chronic inflammatory glaucoma, 6 showed no improvement, 3 improved for 2 or 3 months, 4 improved as long as under observation—one 5 months, one 18 months, one 1 year, one 3 years. Of the 4 operations for subacute glaucoma, one was cured at the end of 2½ years, 2 remained well after 15 months, 1 remained improved after observation of 4 months. Of the 3 operations for acute glaucoma, 1 recovered, 1 improved, 1 was preventive. Of 4 operations for absolute glaucoma, 1 improved as to pain, in 3 there was no improvement or change. Of 2 operations for hemorrhagic glaucoma, 1 improved as to pain and 1 as to vision. One operation for buphthalmos had no effect. After these 68 operations miosis is mentioned 40 times, ptosis 36, conjunctival congestion 19, congestion of the face on the side operated on 6 times, neuralgia and hyperesthesia 6, anesthesia 2, hoarseness or aphonia 8 times, dysphonia once, dysphagia 5 times, and in 1 case the patient had mild hallucinations. As a guide for his own practice Wilder is inclined to follow Abadie's rule: "In acute forms of glaucoma and in the subacute with intermissions, practise first iridectomy, and if it fails, do sympathectomy. In simple glaucoma use miotics twice a day; if they suffice, continue them. If, in spite of their systematic employment, the vision fails, do sympathectomy."

J. M. Ball² (St. Louis), in considering the effect of sympathectomy in optic atrophy, hydrophthalmos, and exophthalmic goiter, reaches the following conclusions: 1. Excision of the superior cervical ganglion of the sympathetic nerve is worthy of a trial in those cases of simple atrophy of the optic nerve which resist measures less heroic. 2. It is yet impossible to say whether the bilateral operation is advisable in unilateral

¹ Jour. Am. Med. Assoc., Feb. 2, 1904. ² Jour. Am. Med. Assoc., Jan. 30, 1904.

optic nerve atrophy. 3. The value of sympathectomy in congenital hydrophthalmos has not been demonstrated. 4. In exophthalmic goiter complete excision of the cervical sympathetic is followed by a larger percentage of cures than is any other procedure. Thus far no deaths have been recorded. The number of operations, however, is small, and final conclusions can be announced only after a large number of cases shall have been treated by this method.

Pathology of the Cervical Sympathetic.—J. E. Weeks¹ (New York) classifies departures from normal in the cervical sympathetic under two heads, namely, irritation and paralysis. 1. The symptoms of irritation are: (a) Mydriasis, due to spasm of the dilator pupillæ; (b) exophthalmos, said to be due to contraction of the smooth muscular fibers of the orbit (Müller's); (c) widening of the palpebral fissure by tonic contraction of Müller's muscle; (d) contraction of the walls of the vessels of the head, face, and neck, including pallor of the skin, frequently with an increase in the amount of perspiration; (e) acceleration of the heart-beat. Cases of irritation of the cervical sympathetic are not common. They have been observed as being due to abscess in the neck; pressure of tumors, as malignant growths, cystic goiter, with exophthalmos; thoracic aneurysm; injuries to the neck; injuries to the spinal cord, between the fifth cervical and third dorsal vertebrae. Irritation symptoms may pass over to symptoms of paralysis and again return to those of irritation, due to irregular pressure. Cystic growths are most apt to produce these phenomena. In none of the histories of the reported cases of irritation of this portion of the sympathetic is mention made of glaucoma as a complication. 2. The paralytic phenomena are divided, according to Nicati, into two stages: First stage: (a) Contraction of the pupil; (b) narrowing of the palpebral fissure (ptosis); (c) decrease of the tension of the globe; (d) increased lachrimation; (e) injection of the ocular conjunctiva, and, in many cases, (f) slight exophthalmos. There is also congestion of the corresponding side of the face, and anidrosis in the greater number of cases, sometimes hyperidrosis; also acceleration of the heart-action in a minority of the cases. Second stage: The ptosis remains. The miosis persists for some months. The miosis, consequent on removing the stellate ganglion in animals, is recovered from in 2 to 3 months. The tension of the eyeball becomes normal after some weeks or months, gradually becoming less pronounced. What may be termed the vasomotor disturbances disappear in a relatively short time. In exceptional cases atrophy of the tissues of the corresponding side of the face follows. Paralysis of the cervical sympathetic may be due to the pressure of tumors, glandular swellings, malignant neoplasms, cicatrices in the neck, aneurysm, abscess, wounds of the neck, injuries to the brachial plexus involving the sympathetic, diseases and injuries affecting the spinal cord, spinal caries, various pulmonary affections; paralysis of the cervical sympathetic also apparently occurs idiopathically. Of the symptoms said to be due to abnormal conditions of the cervical sympathetic and the consequent influence on

¹ Jour. Am. Med. Assoc., Jan. 30, 1904.

the vessels, migraine may be mentioned. This may be preceded or accompanied by disturbances of vision—(a) periodic hemianopsia; (b) scintillating scotoma; (c) monolateral transient amaurosis; and (d) monolateral photophobia. Accompanying migraine we may also have flushing of one side of the face, anidrosis or hyperidrosis, with narrowing of the palpebral fissures and moderate miosis. The affections of the eye, supposed to be caused in greater part by abnormal conditions of the cervical sympathetic, are glaucoma and exophthalmic goiter. Concerning changes in the ganglions, he believes that they undergo degenerative changes in the aged, and refers also to the changes observed by others in syphilis, leukemia, pellagra, infectious diseases, and sunstroke. In discussing the changes in the ganglions in glaucoma, he calls attention to the control experiments of Ira van Giesen, made on ganglions taken from subjects (not affected with glaucoma) as nearly the same age as the operative cases. These experiments showed the ganglions to be normal, with the exception of an excess of pigment in the neuron cell-bodies, the significance of which is not well understood. The results attending microscopic examinations of the ganglions in glaucoma by other observers show pigmentation of the cells and all sorts of inconstant changes, demonstrating that as yet there has been found no alteration peculiar to glaucoma. Weeks further states that while there is not sufficient evidence to say there is any constant change in the cervical ganglions in glaucoma, it is not sufficiently conclusive to enable us to exclude the possibility of such constant change.

ORBIT.

Microphthalmos with Orbital Cysts.—W. Zentmayer and H. G. Goldberg¹ (Philadelphia) give an account of a case of microphthalmos occurring in a full-term female baby which had lived but 36 hours after birth. Autopsy revealed absence of the optic chiasm, external geniculate bodies, and the right optic foramen. The orbits were normal. The especially interesting microscopic features were the cyst cavities in the nerve-fiber layer, the regular cystic enlargements composed of the nuclear layers, and the fibrous septum extending from the wall of the small cyst into the cavity. The presence of the retinal elements in the large cyst-walls and the striking histologic resemblance between the lining membrane of the cyst and the normal retina, and its transition into folds composed of cells similar to those of the ciliary body at a corresponding situation, indicate, in this case, the tendency toward the formation of a supplementary eye.

Acquired Hydrophthalmos.—E. Stieren² (Pittsburg, Pa.) recently enucleated an eyeball, the subject of this disease, measuring anteroposteriorly 32 mm., equatorially 30 mm., while the diameter of the cornea averaged 16 mm. The patient was a girl, 11 years of age. Three years previously the eye had been injured at play, since which time it had steadily enlarged.

¹ Ann. of Ophthal., Jan., 1904.

² Amer. Med., Apr. 2, 1904.

Orbital Cellulitis Due to Pneumococcic Infection.—E. Gruening¹ (New York) describes a case of orbital cellulitis with empyema of the ethmoid cells and the frontal sinus, followed by abscess of the frontal lobe and death. The patient became infected by a pneumococcic invasion, the portal of infection being the nose, whence it traveled upward. The pus taken from the nose, the ethmoid, the orbit, and the brain contained the pneumococcus.

Sarcoma of the Orbit Cured by the Röntgen Ray.—L. W. Fox² (Philadelphia) reports a case of sarcoma of the orbit occurring in a Jewess, 20 years of age, in whom operation was contraindicated on account of its being too formidable, but in whom 46 exposures to the röntgen ray effected a cure. The diagnosis of sarcoma was confirmed by the results of microscopic examination.

Exophthalmos due to Cirroid Aneurysm of the Right Ophthalmic Artery.—A. Kreutz³ gives an account of a case of exophthalmos due to overdistention of the dilated branches of the exophthalmic artery, occurring in a woman, 28 years of age. A tumor of the right orbit was present, causing regular, intermittent pulsations of the protruding eyeball of the same side. A cirroid aneurysmal swelling of the right external carotid artery and an aneurysm of the central retinal artery were also present. Between the inferior maxilla and mastoid process on the same side there was an elongated mass of pulsating vessels. The lobule of the right ear pulsated. The retinal vessels were enlarged, tortuous, and numerous. The onset of the exophthalmos was slow.

Pulsating Exophthalmos with Cure Following Accidental Traumatism.—C. A. Oliver⁴ (Philadelphia) details the history of a case of pulsating exophthalmos in a boy, 15 years of age, following a gunshot wound back of the right ear. The right common carotid artery was ligated, with but little effect, and 10 months later the left internal carotid was tied and the patient placed on a Tuffnell diet. For 25 days following the operation the symptoms were but slightly modified, except for a period of a few hours, during which the bruit and thrill were absent. For 2 months after his discharge from the hospital no change was noticed, but after that period, the exophthalmos and bruit became less marked. Three years after the original accident and 21 months after the second operation the patient collided with one of his playmates, and the morning after the latter accident the bruit disappeared and has not since returned. When last observed, there was no pulsation of the orbit, no thrill, no bruit, the exophthalmos had entirely disappeared, his ocular and general condition was perfect, and there were no cerebral phenomena.

Intermittent Exophthalmos.—W. C. Posey⁵ (Philadelphia) gave a detailed account of a case of this character. Both eyes were usually normal, but under violent muscular strain the left eye slowly protruded, and by this and other signs showed venous engorgement of the orbit.

¹ Med. Rec., Feb. 6, 1904.

² Arch. of Ophthal., 1904, vol. xxxiii, No. 1.

³ Wien. med. Woch., Sept. 12, 1903.

⁴ N. Y. Med. Jour., Apr. 9, 1904.

⁵ Abstr. Amer. Med., June 18, 1904.

The symptoms rapidly disappeared on cessation of the cause. There was absence of bruit or pulsation and of any visible or palpable tumor. There were no ophthalmoscopic changes.

Hydatid Cyst of the Orbit.—C. D. Marshall¹ (London) gives an account of a case of this character occurring in a girl, 5 years of age. The tumor was apparently fluctuating, and about the size of a muscatel grape, situated in the right orbit, between the eyeball and the inferior orbital margin, displacing the eye upward. The cyst was extirpated and examined microscopically. This examination proved it to be a hydatid cyst, but there were no daughter cysts or scolices found.

Bilateral Intraocular Cysticerci.—H. V. Würdemann² (Milwaukee) gives the history of a case of this character. In the right eye vision was reduced to light perception down and out, with small inferotemporal candle field of vision. In the left eye the vision with ametropic correction was $\frac{6}{6}$ and the field was of good size for form and colors, with a small scotoma for black or red dot at 300° (down and out), 10° from fixation.

INJURIES.

Ocular Injuries During Labor.—Thomson and Buchanan³ have reported the results of their observations in this class of cases in the wards of the Glasgow Maternity Hospital. The chief injuries from the pressure of the blades of the forceps are excoriations, edema, fracture of the orbit, corneal affections, hyphemia, paralysis of the ocular and lid muscles, retinal and retrobulbar hemorrhage, optic atrophy, cataract, dislocation of the lens, exophthalmos, and avulsion of the eyeball. They are of the opinion that in cases of contracted pelvis requiring the use of forceps the extraordinary effects which may follow pressure upon the eyeball lead them to believe that almost any injury to internal structures is possible.

Localization of Foreign Bodies.—L. C. Dean⁴ (San Francisco) locates foreign bodies in the eye by means of a modified Mackenzie-Davidson apparatus, consisting of a framework supporting 2 cross wires at right angles to each other and having a mechanism to hold a Crookes' tube in a certain position, so that the luminous point of rays emanating from the anode is perpendicular to both. Two separate radiographs are then taken from different points of view, and the situation of the foreign body calculated by its relation to fixed markings. V. H. Hulen⁵ (San Francisco) has also devised a new localizer for foreign bodies.

Ultramicroscopic Study of Cause of Sympathetic Ophthalmitis.—E. Raehlmann⁶ (Weimar) examined an eyeball, enucleated for phthisis bulbi, by means of a microscope magnifying 2400 diameters, and found the vitreous body swarming with motile bacteria apparently all of the same kind, measuring less than 0.25 micron in one diameter and somewhat longer in the other. The size and motility of these mature organisms

¹ Ophthalmoscope, Apr., 1904.

² Ann. of Ophthal., Oct., 1903.

³ Trans. Ophthal. Soc. of the United Kingdom, 1903.

⁴ Am. Jour. Med. Sci., July, 1903. ⁵ Jour. Am. Med. Assoc., Apr. 2, 1904.

⁶ Deut. med. Woch., xxx, No. 13.

prevent their passing through the vessel-walls like particles of albumin, but he admits the possibility of the younger and smaller forms so doing, thus explaining the cyclic character of certain inflammations and also sympathetic ophthalmitis. He therefore believes that sympathetic ophthalmia is a metastatic infection in the second eye, induced by ultramicroscopic microorganisms whose primary and sole location is in the vitreous, and that the inflammatory reaction in the surrounding tissues is probably the effect of the products of bacterial metabolism, and while it may extend a considerable distance, there is no reason to assume that it alone is able to induce sympathetic ophthalmitis.

Sympathetic Ophthalmitis.—Brown Pusey¹ (Chicago) suggests as the cause of sympathetic ophthalmitis that a damaged eye deteriorates in the orbit, and the cells of this eye (probably the lining cells of the ciliary processes and the iris) can give rise to a specific cytotoxin, which, circulating in the blood, picks out the cells of the fellow eye, and may cause changes which we now designate as sympathetic ophthalmitis. The experiments undertaken to prove this hypothesis were negative in their results.

Samuel Theobald² believes that neither the progressive optic neuritis theory nor the septic theories rest on a substantial basis, and advocates the theory of reflex ciliary irritation. The carefully conducted experiments of Head and Campbell regarding the pathology of herpes zoster, which show that bacteria take no part in either the ganglion or secondary skin lesions, and that the latter are the result of "intense irritation of cells in the ganglion which normally subserve the function of pain," seem to dispose of the only serious objection which has ever been urged to the ciliary nerve or reflex theory of sympathetic ophthalmitis, and bring this theory, which so satisfactorily explains the clinical phenomena of the disease, once more to the front.

OCULAR SYMPTOMS IN GENERAL DISEASES.

Retinal Symptoms of Vascular Degeneration.—L. A. W. Alleman³ (Brooklyn) believes that in many cases it is possible, by an inspection of the fundus oculi, to detect those functional changes which must precede the organic and irreparable changes, and discusses the clinical findings in a large number of cases (Figs. 54, 55). In studying his cases he divided them, for convenience, into 4 groups: *In the first group*, no organic lesion was discoverable by the ophthalmoscope, and the important finding was a tortuosity of the smaller retinal vessels and of their terminal twigs. This should not be confounded with the appearance presented in neuro-retinitis and papillitis. *In the second group* a similar condition of the fundus was observed, but in addition more or less bending of the vessels at the crossings was present (Fig. 54). In many of these cases a change in the caliber of the vessels was observable; this was not an encroachment of the thickened vessel-wall upon the lumen of the vessel, nor was it due

¹ Arch. f. Ophthal., July, 1903.

² Abstr. Amer. Med., July 30, 1904.

³ Amer. Med., Feb. 20, 1904.

to an opacity in the coat of the vessel. This condition of vascular spasm was confined to small areas, suggesting that the contraction was produced by some disturbance in the local vasomotor control. Momentary decrease in the force of the circulation also occurs in this group. He has

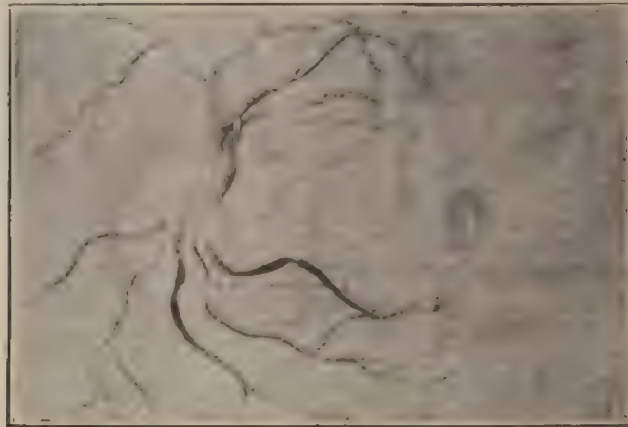


Fig. 54.—Fundus in Alleman's second group of cases (Alleman, in Amer. Med., Feb. 20, 1904).

always found this symptom associated with deficient force of the heart action, usually without organic lesion, as a rule, in anemic and neurasthenic patients. A somewhat similar condition is also seen in patients suffering from organic heart-lesions. *In the third group* some evidence of

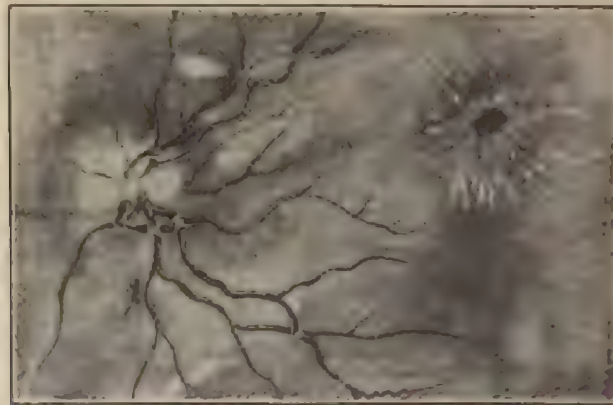


Fig. 55.—Fundus in Alleman's fourth group of cases (Alleman, in Amer. Med., Feb. 20, 1904).

organic change in the vascular wall can be made out. The tortuosity is present, the curve at the crossings is more pronounced, and the bloodstream of the underlying vessel is obscured by the wall of the vessel above. The coat is scarcely visible, but a slight haze can be made out on either

side of the red line of the upper vessel. Minute hemorrhages and small whitish areas are found in advanced cases. *In the fourth group* he includes all cases presenting vascular disease, such as hemorrhagic, albuminuric, and diabetic retinitis, but gives no extended consideration to this class (Fig. 55). Alleman also remarks the frequency with which defective elimination is associated with functional vascular changes. Statistics concerning 40 cases are given, covering every detail of the physical condition of each patient.

The Eyes in Multiple Sclerosis.—Kampherstein¹ reviews 150 cases of multiple sclerosis from the standpoint of their eye symptoms, and tabulates his findings thus: Optic atrophy: 1. Complete optic atrophy was present 4 times—thrice it was bilateral, once unilateral. 2. Optic atrophy was incomplete 28 times (12 bilateral, 16 unilateral). 3. Temporal pallor existed 41 times (16 bilateral, 25 unilateral). 4. Optic neuritis, 9 times (5 bilateral, 4 unilateral). 5. Normal optic disk with visual disturbance, 7 times. Visual field anomalies: 1. Central scotoma with normal visual field periphery—(a) absolute, 9 times (5 bilateral, 4 unilateral); (b) relative, 20 times (14 bilateral, 6 unilateral). 2. Central scotoma with simultaneous peripheral disturbance of visual field, 6 times (2 bilateral, 4 unilateral). 3. Irregular peripheral disturbance of visual field with relatively intact central vision, 12 times (9 bilateral, 3 unilateral). 4. Regular concentric functional vision with field limitation, 1 case. 5. Individual colors not recognized by entire visual field, 2 cases. Paralysis of eye muscles: 1. Abducent paralysis, 14 times (5 bilateral, 9 unilateral). 2. Oculomotor paralysis, 9 times (internal recti of both sides with simultaneous paralysis of right superior rectus, 1 case; internal rectus of one side, 5 times; superior rectus alone, 2 cases; levator palpebrae and superior rectus, once). 3. Paralysis of associated eye movements, 11 times (10 times limitation of lateral movements, 1 case of upward movement). 4. Paralysis of convergence, 3 times. 5. Ophthalmoplegia externa, 2 cases. Nystagmus: 1. Ordinary nystagmus, 22 times. 2. Nystagmus-like tremor, 81 times. Behavior of pupils: 1. Reflex pupillary rigidity to light with miosis (bilateral), 1 case. 2. Reflex pupillary rigidity to light with mydriasis (unilateral), 1 case. 3. Reflex to light diminished without miosis, 3 cases. 4. Considerable difference in pupillary width, 6 cases (4 times with diminished light reaction). 5. Reaction to convergence slight, with relatively good light reaction, 2 cases.

Methyl-alcohol Intoxication.—F. Buller² (Montreal, Canada), in an exhaustive paper, has dealt with the various features of this condition. The prominence of the ocular symptoms was considered at length. He stated that indulgence in ordinary alcohol does not lessen one's susceptibility to methyl-alcohol. He considered methyl-alcohol intoxication as of 3 grades: (1) That attended by mild gastrointestinal disturbance and mild intoxication, ending in recovery. (2) That accompanied by dizziness, marked gastric disturbance, with dimness of vision terminating in blindness. (3) That in which there is sudden overwhelming prostration, ending in coma and death.

¹ Arch. f. Augenheilk., xlix, 41.

² Abstr. Amer. Med., Aug. 6, 1904.

Out of the 51 reported cases, 48 had been observed in the United States, and it had been noted that most of the victims were middle-aged males and that the condition was induced by a debauch in which a cheap grade of liquor was drunk. In the cases he had collected recovery had occurred in only 7. Amblyopia usually began at the end of 24 hours. He referred to the various trade names, such as Jamaica ginger, Colombian spirits, etc., under which the poison was sold, and warned against the possibility of methyl-alcohol poisoning in such cases. Casey A. Wood (Chicago), in a supplementary report, gave an account of 91 hitherto unreported cases. In 8 of these blindness followed breathing of air contaminated with methyl-alcohol fumes. In 62 cases death occurred, but was not preceded by blindness. He referred to the tendency on the part of the western North American Indians to drink red ink (a methyl-alcohol preparation) as a beverage, and the resultant bad effects. The immunity enjoyed by some individuals, especially certain druggists, to methyl-alcohol was mentioned. The most palatable form in which the poison appeared was Colombian spirits, after consuming which, out of 8 persons, 3 will become blind and 3 will die. The diagnosis is seldom difficult, except when other substances, such as quinin, are dissolved in the drug. Blotting out of the peripheral field and central scotoma was present in typical cases. He thought that in all cases with central scotoma and gastrointestinal disturbances methyl-alcohol intoxication should be suspected.

Ocular Syphilis.—S. Snell¹ (Sheffield, Eng.) gives in detail the after-history of a case of extragenital syphilis in a woman 21 years of age. The initial lesion was situated at the inner canthus. The patient was subsequently married and had 7 stillborn children and 4 children born alive. Of the children born alive, 1 died when 8 weeks old, another is paralyzed on one side, the third had interstitial keratitis at the time of the report, and the fourth is healthy. Of greater interest is the fact that the patient herself developed interstitial keratitis, which is unusual in acquired syphilis. W. Reber² (Philadelphia), in a review of the various manifestations of syphilis in ocular structures, voices his conviction that pilocarpin or the "sweat cure" tremendously assists the efficiency of whatever antisyphilitic remedies are used in these cases. In considering the corneal lesions of acquired syphilis, S. Stephenson³ states that the cornea may be affected primarily in 2 different ways: First, under the guise of an interstitial, diffuse, or parenchymatous keratitis; secondly, as a true keratitis punctata, such as first described by Mauthner.

Eye Complications of Smallpox.—A. R. Baker⁴ (Cleveland, O.) gives an account of 23 cases of smallpox in which there were marked ocular complications. All these cases had corneal ulcers; 4 are blind in both eyes, with little hope of improvement; 8 have either been enucleated or atrophied from panophthalmitis; 6 are blind in one eye, but the form of the eyeball is preserved. Three have vision of less than 20/200, and not more than 5 have vision better than 20/200, and 2 have corneal

¹ Lancet, Dec. 19, 1903.

² Lancet, Sept. 26, 1903.

³ Med. News, Mar. 12, 1904.

⁴ Jour. Am. Med. Assoc., Sept. 12, 1903.

fistula, and are still under observation. All these patients had the confluent type of smallpox. A number of the cases were examined bacteriologically, and streptococci were always found. Occasionally a mixed infection, with staphylococcus, was present. Discussion upon this paper brought out reports of several cases in which the primary eruption of variola appeared on the cornea. Basker considers the disastrous results in these cases an urgent plea for vaccination as a preventive of variola.

A New Ocular Sign of Basilar Meningitis.—G. W. Squires¹ (East Avon, N. Y.) states that he has found *rhythmic dilation and contraction of the pupil* present in basilar tubercular meningitis, frequently as early as the fourth or fifth day, according to the severity of the attack. The dilation may be obtained by extension of the head on the spinal column and contraction on flexion of the head.

Dental Disease as a Cause of Ocular Affections.—W. O. Nance² (Chicago) reviews the literature of this subject and gives the history of 4 cases in which carious teeth were the causal factor in the eye-disturbances. One case was orbital abscess, one, third-nerve paralysis, one episcleritis, and one conjunctivitis, in all of which the trouble was traced to a diseased tooth. The affections disappeared with the institution of proper dental treatment. Mention may be, incidentally, made of the paper read before the Pennsylvania State Dental Society, 1903, by L. W. Fox³ (Philadelphia), in which the connection between the eye and the teeth is explained by the distribution of the third cranial nerve. This observer quotes numerous remarkable cases belonging to this class of reflex disorders, and shows that not only may the teeth influence ocular conditions, but that the eye may be a factor in the production of dental disorders. F. Allport⁴ (Chicago) shows that not only may dental affections influence eye-conditions, but aural conditions as well, and after citing several illustrative cases, urges the ophthalmologist and aurist to examine carefully routinely the mouth, in order to detect sources of reflex irritation.

Complete ophthalmoplegia occurring during the course of whooping-cough is reported by B. W. Gowing.⁵ The patient was a boy, aged 4 years. The onset was very acute, and occurred in the morning on awakening, manifested by bilateral ptosis, dilation of the pupils, which failed to react to light or accommodation, and slight divergent strabismus. In 10 days the ptosis and strabismus had disappeared. He regards the attack as one of acute inflammation of the nuclei, possibly accompanied by some hemorrhagic lesion due to straining during a paroxysm of coughing and akin to the process that produces acute anterior poliomyelitis.

External Diseases of the Eye Due to Rheumatism.—R. Kalish⁶ (New York) considers that rheumatism is responsible for a number of external ocular affections which resist the ordinary modes of treatment.

¹ Med. Rec., Mar. 26, 1904.

² Jour. Am. Med. Assoc., Apr. 2, 1904.

³ Dental Digest, Feb., 1904.

⁴ Med. News, Apr. 16, 1904.

⁵ Brit. Med. Jour., Dec. 26, 1903.

⁶ Med. News, Apr. 23, 1904.

He mentions marginal blepharitis of the young adult, recurrent hordeolum or sty, recurrent chalazions, circumscribed bulbar conjunctivitis, limited circumscribed bulbar conjunctivitis, and striated keratitis as belonging to this class.

Contraction of the Visual Field in Rheumatoid Arthritis.—W. M. Beaumont¹ (Bath, Eng.), in considering the ocular symptoms in rheumatoid arthritis, mentions transient obscurations of vision, ephemeral palsies of the extraocular muscles, conjunctival and corneal anesthesia, and especially decided contraction of the visual fields in both sexes. Central scotoma and evidences of optic atrophy were absent. This observer showed diagrams of the visual fields in this disease in which expansion occurred after the inhalation of amyl nitrite, a condition which does not occur under the same circumstances in normal individuals.

Ocular Complications of Mumps.—J. H. Woodward² (New York), in a condensed résumé of the literature of the ocular complications of mumps, gives an account of a case of bilateral mumps in which, several weeks after the attack, the patient complained of pain in the left eye. Ophthalmoscopic examination revealed a condition not unlike thrombosis of the central vein. Vision was reduced to light perception, the upper part of the field was blind, the cornea was hazy, the pupil dilated, tension + 2, and numerous blotches were seen in the fundus. Anterior sclerotomy was performed, with a reduction in the tension but no improvement in the vision. The pupil remained dilated and the cornea was dull, but transparent. When last seen, there was no fundus-reflex and it was impossible to make out any fundus details. The right eye remained normal.

THERAPY.

Acain-Cocain Anesthesia.—Krauss³ (Marburg) employs this combination for the production of local anesthesia in the following proportions: Acain, 0.025; cocain, 0.05; sol. nat. chl., 0.75 % ad 5.0. The mixture is injected, in quantities of 0.2 cc., into the skin surrounding the field of operation.

Local Anesthesia.—J. Guttman⁴ describes the following method of inducing local anesthesia in operations on the eyeball and eyelids, especially in trachoma. One or two drops of a 4 % solution of cocain, or 1 % holocain, are instilled into the conjunctival sac within about 3 minutes. He then fills a Pravaz syringe, holding 25 to 30 minims, with the following solution: Sodium chlorid, 0.2; cocain, 0.05 (for very sensitive patients, 0.1); distilled water, 100; a fine No. 27 needle, one-half inch long, is screwed on to the syringe, which must be perfect. An assistant pushes the piston of the syringe, and as soon as 4 or 5 drops of the solution are injected, a grayish-white wheal is formed and the needle is withdrawn. This procedure is repeated until the whole lid has been anesthetized. As a rule, 15 to 25 drops will suffice for each lid.

¹ Lancet, Feb. 6, 1904.

² Munch. med. Woch., 1903, 34.

³ N. Y. Med. Jour., Jan. 2, 1904.

⁴ Arch. of Ophthal., May, 1904.

Dionin.—W. Reber¹ (Philadelphia) has employed dionin in post-operative complications, iritis, interstitial keratitis, vitreous opacities, glaucoma, corneal opacities, and sympathetic ophthalmitis, with very encouraging results. In one case of iritis complicating operation for secondary capsular cataract the instillation of a 10 % solution of dionin every 2 hours caused cessation of pain within 12 hours, and, within 5 days, subsidence of the disease and entire disappearance of capsule of the lens. He subsequently employed it in 2 cases of dissection for congenital cataract, with gratifying results. In 4 cases of iritis under his observation in which the ordinary remedies were useless the pain was relieved within 2 hours after the beginning of the use of a 5 % solution of the drug. Two cases of interstitial keratitis were markedly benefited by its use in conjunction with atropin. In 1 case of corneal opacity from ophthalmia neonatorum the drug was useless. In 2 cases of hyalitis, of the conventional senile type, it was wholly without effect. In 1 case of glaucoma with a corneal ulcer dionin (10 %) combined with eserine lessened the tension and relieved the pain within 24 hours. The cornea ruptured at the site of the ulcer 6 days later. In 1 case of sympathetic ophthalmia the drug was of marked service in promoting the absorption of plastic exudate in the pupillary space after the offending eye had been removed. Reber also states that dionin is a lymphagog as well as an analgesic. In his own experience he has obtained most benefit from 5 % and 10 % solutions, and remarks the tolerance to the drug which develops from its use longer than 6 or 7 days.

R. Bloch² observes that the dionin reaction occurs only in eyes presenting pathologic conditions (ametropia excepted), and that in healthy eyes it acts only as a foreign body. He also notes that the degree of reaction differs with the affection, but is always most marked at the first instillation, becoming gradually less with each succeeding instillation, and after 4 or 5 days' consecutive use fails to occur. After an interval of several days the initial intensity is restored. Its greatest value, he believes, is in the treatment of corneal opacities. He employs it intermittently, using it for 4 or 5 days in combination with atropin and calomel insufflations, then omitting it, but continuing the other measures for 4 to 6 days. A speck of the powder, he states, is more active than a 5 % or 10 % solution.

A. Darier³ (Paris), after 4 years' personal experience with dionin, states that in many circumstances it is a more valuable remedy than even cocaine. The instillation of the drug to the eye is painful, and attended by temporary discomfort. Dionin should never be placed in immediate contact with the cornea, but should be placed well in the lower cul-de-sac, and in extremely sensitive patients preceded by a drop of cocaine. A 2 % solution is to be used at first, and if not effective within 10 minutes, a 5 % solution may be employed, or the powder may be used, or the solution may be injected beneath the conjunctiva, according to the effect desired. He mentions one case of retinal detachment in which, after other methods of treatment had failed, the retina became reappplied after

¹ Therap. Gaz., Feb., 1904. ² Abstr. Woch. f. Therap. u. Hyg. d. Auges, 1904, 14.

³ Ophthalmoscope, Mar., 1904.

one injection of 2 centigrams of dionin. In acute or subacute glaucoma his invariable rule is to apply dionin to the eye for the relief it affords. He always employs dionin before the dressing is applied, in operations which do not involve the cornea, and in cataract operations after the first dressing on the third or fourth day. This instillation should be made even after the removal of foreign bodies, to remove the zone of infiltration. It is in connection with corneal conditions, such as infected corneal ulcers, diffuse corneal infiltrations, interstitial keratitis, and leukomas, that it is of greatest value, but it may also render service in conjunctival hemorrhage, episcleritis, iritis, and iridochoroiditis. It is analgesic and slightly anesthetic, aiding the action of cocain greatly when used with it. It is a physiologic antiseptic.

A. B. Hale¹ (Chicago) states that dionin has not been so satisfactory in his experience. He thinks it deserves a more modest place in therapeutics than some of its advocates would give it. Its action is not lasting; it is simply an adjunct to other agents, helpful in emergency, but not trustworthy. He says, let us use it as a powder, as a 1 % or 5 % solution, alone or with another drug, but let us not forget that it is always the other drug on which we must rely.

J. Hinshelwood² (Glasgow) uses dionin in 5 % strength in ointment or aqueous solution, and has found it to be a powerful agent for the relief of ocular pain. Its effects lasted from 3 to 4 hours. The drug was found to be but slightly anesthetic.

Spoto,³ in experimenting with dionin, found that in inflammatory glaucoma the drug had an analgesic effect which gave the patient great relief. Tension diminished perceptibly, but the drug seemed to lose its effect gradually when used a long time. In chronic glaucoma it was less efficacious. In exudative iritis it exerted an undoubted and valuable absorptive action, reducing greatly the course of the disease, especially when combined with atropin. Pain was relieved. In leukoma and corneal opacities there was no clearing action.

Eucaïn Lactate.—A. Langgaard⁴ (Berlin) speaks favorably of a new salt of eucaïn—eucaïn lactate—as a local anesthetic. It is water-soluble to the extent of 25 %, and possesses all the advantages of the hydrochlorate; it is nonirritant and produces no hyperemia, ischemia, or shrinkage. In ophthalmology it is advised to use it in the strength of from 2 % to 3 %.

Eumydrin.—Lindenmeyer⁵ reports on a new mydriatic, eumydrin, which is a white, odorless powder, readily soluble in water. It is obtained from atropin, than which it is claimed to be 50 times less poisonous. This observer noticed that 1 % and 2 % solution, when instilled, caused maximum dilation of the pupil in from 20 to 50 minutes, which was retained for about 12 hours. Complete paralysis of accommodation was produced in from 2 to 3 hours, and lasted for a varying period, depending on the age of the patient and other factors. Usually the paralysis of

¹ Ophthal. Rec., Dec., 1903.

² Brit. Med. Jour., Apr. 30, 1904.

³ Abstr. Jour. Eye, Ear, and Throat Dis., May and June, 1904.

⁴ Therap. Monatsh., Aug., 1904.

⁵ Berl. klin. Woch., Nov. 23, 1903.

accommodation subsided at the same time or before the cessation of mydriasis.

Formalin in Infected Wounds of the Eye.—J. H. Claiborne and E. B. Coburn¹ (New York) conclude, from a series of experiments on rabbits, that formalin, 1:500, may be injected into the vitreous of rabbits without producing more than momentary disturbance of the eye, and that formalin, 1:1000, when injected into the vitreous, exerts no influence on streptococcus infection of the vitreous. They further conclude that the results of these experiments warrant the treatment of commencing infections of the eye by injections, into the capsule of Ténon, of 1:1000 or even 1:500 formalin solution.

Iodoform in the Anterior Chamber.—E. C. Ellett² (Memphis, Tenn.) introduces iodoform and gelatin rods, containing 50 % iodoform, into the anterior chamber through a corneal incision, for the purpose of controlling suppuration of the anterior segment of the eye. He advises using this method early and repeatedly, and in conjunction with other local and general modes of treatment.

Stovain.—F. de Lapersonne³ describes a new local anesthetic by the name of stovain. It was prepared by Fourneau from one of the amido-alcohols, and chemically it is the hydrochlorate of benzoic ether of dimethylaminopropanol. It is harmless and causes no ill effects. Lapersonne found the toxicity of the substance to be decidedly less than that of a cocain solution of equal saturation. Compared with cocain under similar conditions, he finds that stovain produces more complete anesthesia of longer duration. Its disadvantage is that its introduction is always painful. Its best effects are produced by subconjunctival injection.

Subconjunctival Medication.—H. McI. Morton⁴ (Minneapolis, Minn.) believes that the favorable results following subconjunctival injections are due to the quantity of the fluid used rather than the direct action of the drug employed. In practice he employs a 3 % solution of sugar combined with a physiologic salt-solution. C. S. Bull⁵ (New York) sees no reason to believe that subconjunctival injections of any of the solutions commonly used bring about any more rapid or favorable results than other methods of treatment hitherto employed for affections of the cornea, uveal tract, or retina. His conclusions are that all reports of the beneficial effects of subconjunctival injections should be carefully criticized and compared with the results obtained by other and less troublesome methods of treatment before accepting them as of any real value.

Subconjunctival Injections of Alcohol.—Peschel⁶ (Frankfort) employs subconjunctival injections of alcohol in most of the commoner affections of the anterior and of the posterior parts of the eye, with success.

Sublamin.—J. Imre⁷ (Hodmezövasarhely) has employed sublamin in the treatment of conjunctivitis in the strength of 1:1000, with success;

¹ Med. News, Nov. 21, 1903.

² Jour. Am. Med. Assoc., Aug. 8, 1904.

³ Recueil d'Ophthal., May, 1904.

⁴ N. Y. Med. Jour., July 18, 1903.

⁵ Trans. Am. Ophthal. Soc., 1903, p. 31.

⁶ Klin. Monatsbl. f. Augenheilk., Nov.-Dec., 1903.

⁷ Woch. f. Therap. u. Hyg. d. Auges, vii, 4.

if used too frequently, however, it is capable of injuring the epithelium and causing the formation of a false membrane.

Warm Medicated Sprays.—D. T. Marshall¹ (New York) has returned to an old, but seemingly little known, method of treating certain ocular affections by means of warm medicated sprays generated from a steam atomizer. He states that it is indicated in almost all diseases of the conjunctiva, as acute catarrhal, chronic, epidemic, gonorrheal, trachomatous, and phlyctenular conjunctivitis; in corneal ulcers, in corneal infiltration, in interstitial keratitis, and in iritis.

Yohimbin.—J. H. Claiborne and E. B. Coburn² (New York) report on the use of this new alkaloid, derived from the yohimbe tree, a native of West Africa. The hydrochlorate is the salt usually employed, and is fairly stable, except in solution, when it deteriorates rapidly. Their experiments showed it to be a nontoxic local anesthetic. A 2 % solution instilled into the normal eye twice, at intervals of 2 minutes, will, in 5 minutes from the initial instillation, produce a corneal and conjunctival anesthesia which lasts about 5 minutes. Six instillations in 10 minutes of a 2 % solution of yohimbin will produce an anesthesia of the cornea which persists as complete anesthesia for 35 minutes after the last instillation, and disappears completely only at the end of an hour and a half. The drug is also a mild mydriatic.

PHOTOTHERAPY AND RADIOTHERAPY.

Phototherapy in Ophthalmology.—H. Strebel³ (Munich), in a report of some experimental work as regards the application of light treatment to the eyes, states that the results from this method indicate that the ocular tissues react in a different manner to the chemic rays than do the cutaneous structures. The media of the eye allow the free passage of the ultraviolet rays, and he found it possible to induce a circumscribed inflammation in the retina. The iris responded to the chemic rays with hyperemia, moderate inflammation, and pigmentation. It protects the tissues beneath, except when purposely excluded. He is convinced that conjunctivitis, blepharitis, eczematous keratitis, and chalazion will prove amenable to phototherapy, and there is also a possibility that gonorrheal processes may be included in the list. He even suggests that direct sunlight may be utilized for tattooing the cornea.

Relation of the "N" Rays to Vision.—The relation of the "N" rays to vision has recently attracted the attention of several scientists. Blondlot⁴ has observed that the eye is itself a source of the rays, and also that the sensitiveness of this organ to light is augmented under their influence. A. Charpentier⁵ (Nancy), in experimenting with the N rays, found that they possess the property, to some extent, of increasing visual acuity. This property is most marked when the N rays emanate from a steel plate held to the head in a dimly lighted room; the maximum effect

¹ Med. News, Dec. 26, 1903.

² Klin.-Therap. Woch., 1903, x, No. 45.

³ Med. News, July 9, 1904.

⁴ Lancet, Feb. 27, 1904.

⁵ La Sem. méd., xxiv, No. 6.

being produced when the steel is opposite the angular gyrus. This observer also found, on his own person, that luminous sensations were produced in the dark under the influence of these rays, and he considers this as the first example of direct nerve-stimulation.

Radium Rays.—E. S. London's¹ numerous experiments demonstrate that the rays of radium, by their action on the retina, produce perception of light in the eye even at considerable distance. The radium rays, differing from light rays physically, are also dissimilar from them by their physiologic action on the visual apparatus. In themselves they do not augment the visual power of the eye. The radium rays are neither refracted nor reflected by the media of the eyes, but are absorbed to a certain degree by them simultaneously. When acting upon the eye sufficiently long and strong, they are capable of producing inflammatory conditions in its various parts (keratitis, retinitis, etc.). Persons with bandaged eyes are able, after some practice, to recognize the shape of moving radium rays and can name simple figures described with them. Portions of the retina not atrophied can easily perceive this light in the dark room. At the request of the Prussian Ministry for Ecclesiastic, Educational, and Medicinal Matters, Professor Greeff,² of Berlin, undertook an investigation of the properties of radium. His conclusion, as might be expected, is that radium has absolutely no power to make the really blind see. London, who is not an ophthalmologist, neglected to test beforehand as to the vision remaining to the eyes of the persons examined by him; neither did he make any control experiments with the simple dull screen. Persons that are but partially blind can distinguish objects behind a screen illuminated with radium; but the same is true when a dull screen is lighted with an ordinary oil-lamp.

F. H. Williams³ (Boston) states that the beta-rays emitted by radium correspond to the cathode rays and the gamma to the röntgen ray. He thinks the beta-rays seem likely to prove a convenient and useful remedy in certain, otherwise unyielding, ocular diseases. In very obstinate cases of trachoma he found that good results followed promptly from exposures of 2 or 3 minutes to 50 mgm. of pure radium bromid, given at first once a week and later twice a week. The radium was held about 0.5 cm. from the everted lid, or was placed even nearer to the closed lid, opposite the diseased area. He also gives the notes of a case (in his brother's practice) of corneal opacity in which the vision was markedly improved by this mode of treatment. Before treatment the vision was 0.1. After treatment the patient had vision of more than 0.5, and could read ordinary print.

Tracy⁴ reports a case of optic atrophy of 4 years' duration occurring in a man, 52 years of age, in which exposure to radium produced improvement in vision.

Röntgen Ray and Radium.—A. Darier⁵ (Paris) reports a case of

¹ Arch. f. Ophthal., 1903, lvij, 342. ² Deut. med. Woch., Mar. 24, 1904.

³ Boston M. and S. Jour., May 26, 1904.

⁴ Jour. of Advanced Therap., Dec., 1903.

⁵ Abstr. Ann. of Ophthal., Jan., 1904, 153.

alveolar sarcoma of the eyelids cured by 15 séances with the röntgen ray. Radium, applied externally, he says, is a most powerful analgesic, relieving neuralgia, the pains of rheumatic iritis, traumatic iridocyclitis, etc., as well as the excruciating pain of inoperable cancer.

Röntgen and Becquerel Rays in Ocular Therapy.—A. Darier¹ (Paris) reports a series of cases treated by these rays. The first case consisted of multiple malignant tumors of the eyelids, conjunctiva, face, neck, and mediastinum. After ten 10-minute treatments by the röntgen rays in the course of 15 days, all the tumors of the face had disappeared and the symptoms induced by the mediastinal growths had vanished. The Becquerel rays obtained from radium were employed in 1 case of hereditary specific periorbital neuralgia, 1 case of acute blennorrhœic iritis, 3 cases of iridocyclitis following traumatic cataract, and 1 case of hemorrhage into the vitreous following perforation of the sclera, with marked improvement. Two cases of detachment of the retina and one of parenchymatous keratitis gave negative results.

INSTRUMENTS.

Modification of Anterior Chamber Irrigator.—J. A. Lippincott² (Pittsburg) describes a modification of his original irrigating apparatus, consisting in the addition of a convenient and effective shut-off, designed

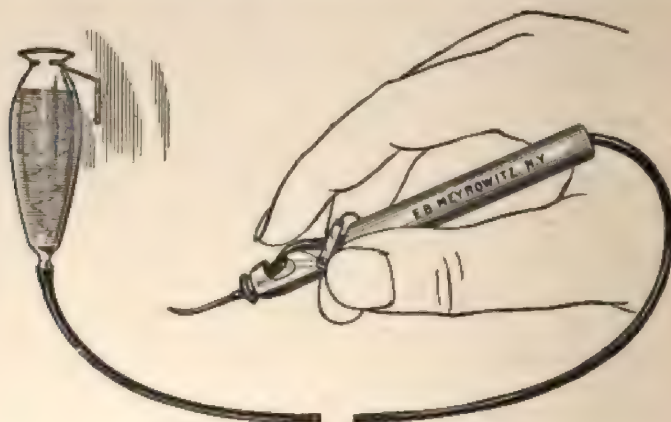


Fig. 56.—Lippincott's new irrigator.

to prevent the backward flow which may occur if the reservoir is allowed to drop lower than the tip (Fig. 56). The tip is larger than formerly, permitting a more generous stream, and the general finish is superior. In other respects it is unchanged.

An Improved Form of Apparatus for Testing the Position of the Axes of the Eyes.—C. H. Williams³ (Boston) has devised a new appa-

¹ Med.-Chir. Zent., Oct. 9, 1903.

² Am. Jour. of Ophthalm., July, 1904.

³ Abstr. Amer. Med., Aug. 6, 1904.

ratus for testing the position of the eyes, consisting of vertical and horizontal arms holding electric lights, controlled by a switch, and arranged in 3 combinations: (1) Vertical red lines with horizontal green figures; (2) horizontal red lines with vertical green figures; (3) red lines and green figures in the same vertical line. The patient is directed to look through spectacles with one red glass and one green. Looking at the apparatus in the first or second position, if he sees the red line at the zero-point of the figures, it shows there is no deviation right or left, up or down; if the red line comes over one of the figures, the number shows the direction and amount of deviation, and the number of the prism needed to correct the deviation. In the third position errors of rotation are shown.

Lid Elevator.—F. C. Parker¹ (Norristown, Pa.) has devised a small lid elevator especially for use in small palpebral fissures as are found in newborn infants (Fig. 57). It is made of a framework with a cross-bar, enabling the surgeon to raise the lid and at the same time view the conjunctiva and make any application thereto while the elevator is in place, which cannot be done with a large solid elevator.

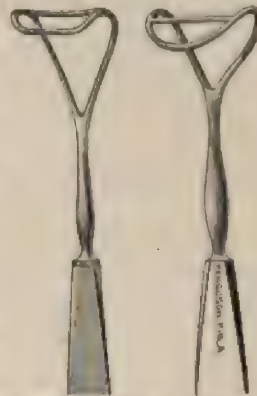


Fig. 57.—Parker's lid elevator.

Eyelid Everter.—A. D. Reid and A. Edmunds² has devised a simple appliance for the eversion of the eyelids during röntgen-ray treatment (Fig. 58). To apply the device the spring is pressed together and the

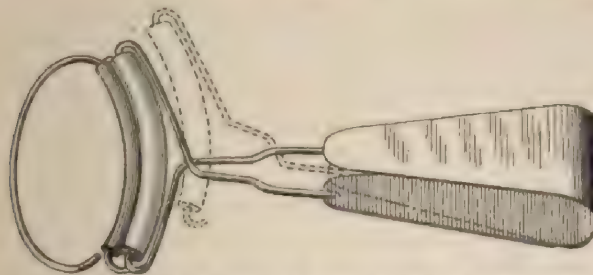


Fig. 58.—Reid and Edmunds' lid everter (Lancet, Aug. 15, 1903).

eyelashes are seized between the jaws of the clip in such a way that the curved piece of wire is to the outer or cutaneous aspect of the eyelid. The whole clip is then simply turned upward and fixed by a tape. The jaws of the instrument are coated with india-rubber.

¹ Amer. Med., Aug. 8, 1903.

² Lancet, Aug. 15, 1903.

DISEASES OF THE NOSE, THROAT, AND EAR.

By D. BRADEN KYLE, M.D., AND J. LESLIE DAVIS, M.D.,

OF PHILADELPHIA.

DISEASES OF THE NOSE.

Coryza.—Brand¹ suggests that a threatened attack of coryza may sometimes be aborted by frequent inspiration of the following solution: carbolic acid and solution of ammonia, each, 5 parts; alcohol, 2 parts, and distilled water, 15 parts, mixed. The same result may be obtained by a single intranasal spraying with the following: Ichthyol, 5 parts; alcohol and ether, 50 parts each by weight. [It is always well to look into the constitutional condition of the patient.]

Genglaire² (Coucy-le-chateau) suggests for coryza painting the nasal fossas 5 or 6 times daily with a pencil of absorbent cotton steeped in hydrogen dioxid. He states that a cure generally results within the 24 hours. Pognat³ recommends the following method of making topical applications in coryza: Cocain hydrochlorate, 25 grains; menthol, 25 grains; liquid petrolatum, one fluidounce. Use a small quantity every 3 hours.

The Local Use of Quinin in Hay-fever.—Henry D. Fulton⁴ (Pittsburg), recognizing that numerous remedies have been suggested for the relief of hay-fever, but after a trial of more or less thoroughness the great majority may be considered useless, while none has yet been found effectual in all cases, suggests another, which he trusts will be given a trial and its results reported. The treatment consists in the employment of a saturated solution of quinin sulfate in sterilized water as a nasal spray, and the application, to the mucous membrane of the nares, of an ointment consisting of quinin and vaselin in the proportion of 30 grains to the ounce, the application being made every 4 to 6 hours. After trying various unguents and combinations he finds simple vaselin superior to white vaselin or liquid vaselin, and even to lanolin, on account of the last being offensive to the sense of smell. The use of the spray alone will not suffice, since its effect is of short duration unless followed by thorough application of the ointment. This, he suggests, may account for the failure of this treatment as first suggested by Helmholtz, who employed only the spray. The application of the ointment should be made at least every 6 hours, and it may even be found better in some cases every 4 hours. An application at bedtime and at 2 or 3 o'clock in the morning will prevent all symptoms

¹ Dublin Jour. Med. Sci., Aug., 1903.

² Nouveaux remèdes, Jan. 8, 1904.

³ Méd. moderne, Jan. 6, 1904.

⁴ Med. Rec., June 25, 1904.

during the night. So far as the effects of this simple remedy have been observed, the results are as follows: Used according to the foregoing suggestions, the symptoms of coryza are immediately removed, nor will they return so long as the treatment is continued. The usual accompanying irritation of the eustachian tubes and palate quickly subsides. Opportunities have not been had so far to test this treatment in irregular types of the disease or to estimate how far these results may be modified by individual peculiarities, but so far as its effects have been noted, it seems fair to conclude that hay-fever subjects will find this a remedy of actual value, and that it will promptly and completely relieve a large proportion of these cases. [Why not, by internal medication, change the reaction of the secretions, thereby removing the underlying etiologic factor?]

A Cause and Cure of Hay-fever.—F. E. Stowell,¹ being a victim of hay-fever himself, and acting upon the belief that it was a disease of the nervous system and not due to some irritant deposited upon the nasal mucosa, began to search for some factor which was present at this time of the year and absent at other times. He hit upon the possibility of an influence from the strongly actinic rays of the sun at this season affecting the very sensitive ciliary nerves and reflexly causing the paroxysms of an attack of hay-fever. Acting upon this mode of reasoning he began to wear colored glasses and found that he was almost immediately relieved. The condition would at once return if he went out without wearing them, and would as quickly be relieved by putting them on again. He has since observed the same effect in 2 or 3 other cases, and is anxious to have the simple experiment tried by others to determine what percentage of cases can be helped in this way.

Hay-fever.—E. Fletcher Ingals² recommends the following formula for nasal spray in hay-fever:

| | |
|------------------------------------|---------------------|
| R. Resorcin..... | 5 grains |
| Adrenalin chlorid..... | $\frac{1}{2}$ grain |
| Boric acid..... | 15 grains |
| Hot camphor water..... | 4 drams |
| Glycerin..... | $\frac{1}{2}$ dram |
| Distilled water, enough to make .. | 2 ounces |

Macerate 24 hours, then filter. Spray the nose and eyes every 2 hours.

Neuroses of Nasal Origin.—G. Hudson Makuen³ bases his conclusions on this subject not alone upon rhinologic work, but upon a careful study of the nasal conditions found in about 1000 purely neurotic subjects. There are two ways in which the nervous system may be affected by intranasal diseases: (1) By interference with normal respiration, and (2) by peripheral nerve irritation. Free nasal breathing over normal mucous membrane is exceedingly important as a means of keeping the entire respiratory tract in good condition, and indirectly of giving tone to the general nervous system by the proper aëration of the blood; and perverted nasal breathing and mouth breathing are frequently causal factors in many grave neuroses and psychoses. Deviations and obstructions of the

¹ N. Y. Med. Jour., Sept. 5, 1903.

² Clin. Rev., Oct., 1903.

³ Amer. Med., June 4, 1904.

inspiratory air-current caused by structural irregularities within the nasal chambers, and the vitiated air-supply that results from breathing over diseased mucous surfaces are responsible for quite as many nervous symptoms as accrue from peripheral irritation within the cavities of the nose. The various sensory neuroses, such as disturbances of olfaction (parosmia, hyperosmia, and anosmia), many neuralgic pains of the head, pharynx, ear, and face, and some of the diseases of the eye, as, for instance, epiphora and conjunctivitis, can best be explained on the theory of interference with normal respiration by obstructive nasal lesions and catarrhal conditions. It is quite possible also that toxic disturbances of the cerebral functions may result from absorption of catarrhal and septic material within the nostrils and accessory cavities. Aproxesia is a condition present in almost all cases of stammering and the allied disorders of speech, which Makuen states that he generally finds associated with the aforementioned nasal conditions, and he has come to look upon them as a probable causal factor. Of all the peripheral and vesicular regions of the body, excepting only the eye, the nose is probably the most sensitive and susceptible to irritation. By means of its own copious nerve-supply and through the sphenopalatine, the gasserian, and superior cervical ganglion of the sympathetic it has direct connection with the pneumogastric, and when we recall the wide distribution of this latter nerve throughout the thoracic, abdominal, and pelvic viscera, we can well understand the possibilities of nerve disturbances in these regions due to peripheral nasal irritation, and we can also understand the rationale of their treatment by the removal of this irritation. However, we must keep in mind the fact that we are dealing in many instances with nervous phenomena that have no demonstrable anatomic or pathologic foundation, and because we know so little about them we call them neuroses, a term that is as indefinite as the condition for which it stands. As an illustration he cites the case of a boy 12 years of age, who had suffered with cough and asthmatic breathing for 3 years. Some time ago he removed a small exostosis of the nasal septum and cauterized a single follicle on the pharyngeal wall, and he has had scarcely any cough or asthmatic breathing since that time. He states that in this case he cannot claim to have cured a disease, but rather to have removed the symptoms. Another patient, aged 7, had severe choreic twitchings of the orbital and facial muscles until after the removal of adenoid vegetations and the resultant nasal catarrh, when the symptoms promptly ceased. Whatever of disease the patient had before the operation he still has, as is shown by the fact that the twitchings recur to some extent with every exacerbation of the nasal catarrh. Another patient, aged 26, has stammered during the greater part of his life, and under the usual treatment, which consisted in his case in the removal of a septal ridge causing slight intranasal pressure, and appropriate psychophysical training, his general condition improved satisfactorily and he acquired perfectly free speech; but, as in the 2 cases cited before, he did not cure a disease, but simply removed temporarily a symptom, as was shown by the fact that when the crucial test came, some weeks later, in an attempt to read, his tongue seemed to cleave to the roof

of his mouth, and although pregnant with words, he was unable to deliver himself. Thus are given 3 typical cases—one of asthmatic breathing, one of choreic twitchings, and one of stammering, the patients all being of the so-called neurotic temperament. There is a general tendency to be irritated, and this tendency characterizes all cases of so-called reflex neuroses of nasal origin. It often takes the form of neurasthenia, hysteria, or aprosexia, and it may be the direct result of the nasal conditions herein described, but it is almost never of purely reflex origin. In conclusion he makes the following deductions: (1) It is reasonable to suppose, though not absolutely proved, that some of the more serious mental and cerebral diseases may be of nasal origin. (2) Many of the so-called reflex nasal neuroses may best be explained on the theory of faulty respiration and impaired cerebral circulation due to direct intranasal pressure and the absorption of toxic catarrhal products through the blood and lymph circulation. (3) A careful examination of the nose is imperative in all doubtful cases of diseases of the nervous system.

Neurasthenia and Pseudophobia of Intranasal Origin.—C. Compaired¹ has found many different types of neurasthenia and pseudophobia the origin and continuance of which are due to intranasal lesions. These are generally narrowing of the nares, with or without compression of the tissues and of the ethmoid, as the result of hypertrophy of the mucous membrane and deviations of the septum; with these may be found septal spurs and enlargements of the turbinated bones and zones of hyperesthesia. Successful treatment of these lesions may be followed by the disappearance of the neurasthenic and pseudophobic symptoms. It is possible that these lesions maintain a distinct relation in form, quality, and importance to the crime of the criminal who is hunted down and punished.

Treatment of Atrophic Rhinitis.—J. M. Brown,² having used it successfully in 3 severe cases, recommends the employment of acetozone, the new organic dioxid formed from the anhydrids of benzoic and acetic acids. After removing the crusts the acetozone is applied and a nasal spray used daily, consisting of a solution of 0.5 % of pure acetozone in a neutral organic oil.

L. Lack³ suggests as a treatment for atrophic rhinitis, after thoroughly cleansing and removing all crusts, to pack the cavity with a strip of cyanid gauze, which should be used 1 inch wide and 12 to 20 inches in length. The patient can readily be taught to do the packing, since the use of the gauze is painless and causes no irritation. The closing of the nostril prevents the discharge from drying, and since no air can enter the nose, no crusts are formed, and on removing the gauze, which should be done once or twice daily, any accumulated discharge can be removed by simple douche. The packing of the nostril must be continued until the nasal discharge ceases, which may be for 3 or 6 months. The mucous membrane having once been destroyed by atrophic degeneration, the prognosis must be guarded, with the exception of relieving the distress-

¹ Med. Press and Circular, June 10, 1903.

² Medicine, July, 1903.

³ Clin. Jour., Dec. 23 1903

ing symptoms. In a case that has been so far cured that all discharge has ceased all that remains is a dry nose with a tendency to collect dust and mucus. If this cavity is washed daily with salt and water as a part of the ordinary morning toilet, no further treatment will be required and no great discomfort will remain.

Treatment of Ozena.—A. Casassa,¹ believing that *Bacillus mucosus* is the cause of ozena, has studied the effect of a number of bactericidal agents upon this germ in the hope of discovering a cure. White or colored sunlight or light from artificial sources had very little effect upon the growth of the germ, but radiotherapy proved singularly effective. The virulence of the exposed cultures was very much diminished, and white mice survived otherwise fatal injections a much longer time. Clinically the germs are killed upon the nasal mucosa, glandular activity is stimulated, and a permanent cure is established.

The Curative Effect of Erysipelas upon Atrophic Rhinitis.—I. Valentine Levi² believes that complete cures in cases of atrophic rhinitis are exceptional. He reports a case in which treatment effected but little improvement until after an attack of erysipelas, when the nasal condition was greatly ameliorated. This attack was followed by 2 others in rapid succession, after which no traces of the atrophic rhinitis remained. But there had been overreaction, the mucous membrane of the nose was red and congested, and there was hyperemia of the right middle and lower turbinates. Not a vestige of the original condition remained in the nose. In relation to the effect of the erysipelas on the atrophic rhinitis Levi suggests the following factors: (1) The pathology of the two diseases is diametrically opposite: in the one there are anemia and atrophy, and in the other, hyperemia and swelling. (2) The action of the bacterial products of erysipelas on certain other diseases, as has been demonstrated. The literature on the subject is scarce.

In an editorial comment in the *Medical Record*³ we note the following: "A specialist who recently saw the case diagnosed the condition as specific. During the existence of the atrophic rhinitis the patient had no specific treatment and if the atrophic condition depended upon syphilis, it adds interest to the case."

Nasal Polyps: A Study of 147 Cases.—J. Payson Clark⁴ (Boston) states that in an endeavor to determine what are the immediate causes of the growth of nasal polyps, the predisposing causes, and whether all cases or only certain varieties can be permanently cured, he began, about 7 years ago, to get as complete a history and keep as perfect a record as possible of all the cases of nasal polyps which came under his observation. It is from the records of these cases that the basis of this paper is formed. The greatest difficulty he encountered in making a study of these cases and noting the result of treatment was the irregularity with which patients would follow up the treatment and report at the time desired for observation. The subject is treated at some length from the standpoint of pathology, etiology, symptoms, sequels, treatment, and prog-

¹ *Rev. internat. de Therap. Phys.*, Oct. 1, 1903. ² *Therap. Gaz.*, Mar. 15, 1904.

³ *Apr. 23, 1904.*

⁴ *Poston M. and S. Jour.*, July 2, 1903.

nosis, from which he draws the following concluding points: (1) The question of a previous injury to the nose is to be considered in the etiology of polyps. (2) Probably only a small proportion of cases are caused by sinus disease (usually ethmoiditis). (3) A local vasomotor disturbance, which may be of constitutional origin, stands in a causative relation to polyps in a certain proportion of cases. (4) The removal of the whole middle turbinate will be found necessary in many cases where the growths are diffuse. (5) Many cases of nasal polyps can be cured if patients will return for treatment as instructed.

The Local Use of Formalin in the Treatment of Nasal Polyps Before and After Operation by the Usual Methods.—Adolph Bronner¹ states that he does not intend to enter into any discussion on the causes and treatment of nasal polyps, but wishes simply to record his experience with the local application of formalin in these cases. He gives credit to work recently done by Zuckerkandl, Hajek, Grünbaum, Lack, and others, to whose investigations we are indebted for the conclusion that nasal polyps are the result of chronic inflammation of the mucous membrane due to local irritation by pus, etc., or to focal suppuration; and that generally the underlying periosteum, often also the bone, is diseased. In many cases one or more of the accessory cavities, especially the ethmoid cells, are affected, which partly explains the great tendency of polyps to occur, and the frequent necessity for surgical interference. Following the removal of polyps by snare, he makes an application of formalin by means of a probe with cotton-wool to the roots of the polyps. A solution of formalin 1:500 is given to the patient after a few days, to be used by means of spray 3 times a day, and then less frequently after a week or two, stopping it altogether at the end of a month. He claims that this acts not only as a powerful disinfectant, but also causes contraction and hardening of the diseased tissues. There may be frequent recurrence of polyps after this method, but less frequently, he claims, than otherwise, and after several removals eventually disappear altogether.

Primary Cancer of the Nose.—Lenart and Donogary,² from a study of 7 cases of cancer of the nose observed in their own practice and others, gathered from literature, conclude that carcinoma is the most frequent. One-half of the cases originate in the middle turbinate. The next most frequent sites are the inferior turbinate, septum, roof of pharynx, medial wall of the antrum of Highmore, and sphenoid cavity. Clinically, the authors do not believe that sarcoma and carcinoma can be differentiated, a positive diagnosis being made only by histologic examination. Endonasal surgery is of value only in the beginning. Prognosis is bad, there being only 2 cases on record with a definite cure effected.

A Case of Rhinophyma.—W. W. Keen³ (Philadelphia) reports an interesting case of this somewhat rare condition, in which operation was followed by good results. The patient was a man of 65 years, a tailor by

¹ Brit. Med. Jour., Oct. 31, 1903.

² Orvosi Hetilap, No. 21; Monats. f. Ohrenheilk., xxxviii, No. 1.

³ Med. News, Jan. 9, 1904.

occupation, with no history of injury. Fifteen years ago he had what was probably an attack of acne rosacea, in which the nose and the adjacent borders of the cheeks were most prominently affected. This was followed by a nodular growth of the nose which involved all of that organ except the upper fourth, though at no time did it give rise to any pain. Breathing was interfered with, but the projecting mass caused much difficulty in eating. Operation consisted in an elliptic incision with removal of the inclosed part, followed by shaving of the growth on each side. Contrary to expectation, there was very little hemorrhage. The cosmetic result is very good, an interesting point being that over the area where the growth was simply shaved off there has been reproduced normal appearing skin instead of scar tissue. Histologic study of the removed tissue showed it to be a soft fibroma of the skin, with conspicuous distention and possibly hyperplasia of the sebaceous glands.

Some Cases of Facial Erysipelas from Erosions of the Nasal Septum.—John W. Farlow¹ (Boston) makes a casual observation of erysipelas as it is usually regarded both surgically and medically, stating in the latter case that there is one form of erysipelas—facial—which seems particularly prone to occur where there has been no injury. He believes that in such cases, if the nose is thoroughly examined, a point of infection will frequently be found on the septal wall. The septum is the usual seat of nosebleed, ulcerations, and perforations, and these are, without doubt, more common than all other lesions of the inside of the nose. Thus in an examination of facial erysipelas these points are usually overlooked and the case is put down as a medical erysipelas without any external point of infection. The ethmoid region suggests itself as a possible starting-point of erysipelas infection, as being in close proximity to the part of the nose where the external redness commonly begins; but ethmoid disease is not nearly so common as are erosions of the septum, and from its more protected situation is probably not so likely to furnish a favorable situation for the lodgment of germs others than those of influenza. The 3 patients whose cases are reported are all over 40 years of age, and had been subject to occasional attacks of erysipelas, which yielded to the treatment of a large open wound found in the nose. He states in conclusion that at the Massachusetts General Hospital all cases of facial erysipelas coming to the department of diseases of the skin are referred to the department for diseases of the nose and throat for examination of the nose, and believes that very likely if this custom were more prevalent, cases of recurrent facial erysipelas might be much diminished in number.

Resection of the Nasal Septum with Report of 15 Cases.—Leon E. White² (Boston) reports 15 cases of operation by this method, recently described by Otto T. Freer, of Chicago, with favorable results. He summarizes the advantages as follows: (1) There is accuracy, the work being done under the eye of the operator. As every part of the deflected portion can be seen and then removed, the position of the septum will be uniformly good. In no other operation is there such a certainty as to the result. (2) Splints do not have to be worn—these at the best are a great nuisance

¹ Boston M. and S. Jour., Dec. 17, 1903. ² Boston M. and S. Jour., Apr. 21, 1904.

to both operator and patient. (3) Rapidity of recovery: 3 or 4 weeks as against 6 or 8 by other methods. (4) Lack of pain, due largely to the absence of traumatism. (5) Short after-treatment. (6) Freedom from sepsis. (7) Free respiration 48 hours after the operation. (8) It is available for either bony or cartilaginous deflections. (9) It creates the utmost possible space by not only straightening the septum, but by reducing its thickness to that of the 2 layers of the mucosa. (10) The lumen of the concave side is never lessened.

Nonsyphilitic Perforation of the Nasal Septum.—Felix¹ emphasizes the importance of noting all causes of perforation of the nasal septum, owing to the fact that they are too frequently treated as specific without a definite diagnosis. Among other conditions which he mentions that may produce septal perforations are the following: Simple ulcer, which never attacks the bone; occupation ulceration, occurring in workers in cement, the chromic acid salts, and Swedish matches, which may involve bone. Perforation is common among cobalt mine workers and among those who come in contact with arsenic as variously employed in manufacturing; also in glass factories and in the manufacture of paper, dextrin, sodium carbonate, and hydrochloric acid. Other causes are atrophic rhinitis, traumatism,—as, for instance, from nasal operations,—perichondritis, and foreign bodies. Diseases following which perforations have been noted are typhoid fever, diphtheria, smallpox, tuberculosis, sarcoma, lupus, dental cyst, Bright's disease, leprosy, glanders, rhinoscleroma, and tabes dorsalis. [This is quite true; many cases with perforation are non-specific.]

Syphilitic Chancre of the Inferior Turbinate Bone in a Lad of 7.—Brunon² states that when this case was first seen there were evident secondary symptoms, but though carefully examined, the initial lesion could not be discovered. After some days an enlarged lymphatic gland, the size of a filbert, was noticed on the left side of the hyoid bone, and as the glands of this region are tributary to the pituitary mucous membrane, he examined the interior of the patient's nose. On elevating the inferior turbinate bone, which was resting on the septum, he found a small, intensely red ulcer, with punched-out borders, about $\frac{1}{2}$ cm. in size. It was a chancre, and was the channel through which infection had entered. The parents and members of the household were free from syphilis. The child was in the habit of scratching himself and of picking his nose. Besides he was accustomed to stuffing into his nostrils all sorts of things, such as pen-holders, pencils, bits of wood, etc. Several hypodermatic injections of calomel were used, and the patient ultimately recovered. The practical conclusion is that, when unable to find the route by which syphilis has entered a patient's body, the practitioner should examine the patient's nose with a speculum. This precaution will be all the more necessary if enlarged lymphatic glands in the submaxillary and hyoid regions indicate the probable site of the initial lesion.

A Paraffin Injection into the Nose Followed Immediately by Blindness from Embolism of the Central Artery of the Retina.—

¹ La Sem. méd., Feb. 10, 1904.

² Loire méd., Dec. 15, 1903.

L. M. Hurd¹ reports a case in which paraffin had been injected beneath the skin of the nose for correction of deformity on 2 occasions without any unusual symptoms, but when attempted a third time, resulted in the production of blindness. A mixture of paraffin and white vaselin was used at a temperature of 110° F., injected from below upward. At the moment of injection the patient rubbed his right eye and stated that he could not see. Slight ecchymosis occurred about the tip of the nose, indicating that a vein had been punctured. On examination of the eye 25 minutes later it was discovered that the inferior branch of the central artery of the retina

was empty and collapsed. Medical treatment and massage of the eyeball failed to restore the lost vision. [This is another warning that one cannot be too conservative in the use of paraffin. We do not know its effect on tissue several years after injection.]

Instrument for the Removal of Foreign Bodies from the Nose.

—Arthur Roberts² describes an instrument

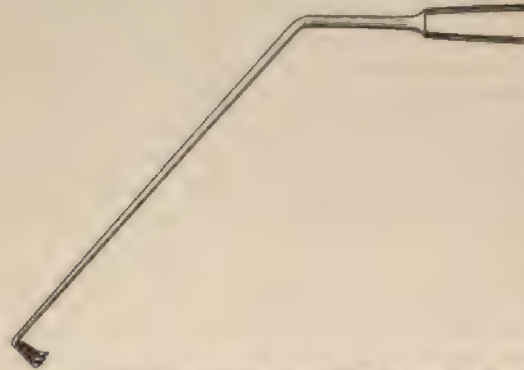


Fig. 59.—Roberts' instrument for removal of foreign bodies from the nose (Lancet, Apr. 9, 1904).

which he has designed for the removal of foreign bodies from the nose (Fig. 59). The end of the instrument is flattened and turned down, this portion being 6 mm. in depth and being provided with 3 small teeth. It can be readily passed into the nose beyond the object to be withdrawn, and gentle traction will lead to rapid removal of the foreign body without laceration of the surrounding parts.

DISEASES OF THE ACCESSORY CAVITIES.

Surgical Treatment of Suppurative Lesions of the Nasal Accessory Sinuses.—Herbert Tilley³ makes a report of 8 typical cases of sinus infection which recently occurred in his practice, and uses them in illustrating some of the chief symptoms, the diagnostic features, and the method of treatment of some of the commoner suppurative lesions of the nasal accessory sinuses. The following general considerations are noted: For many years it has been recognized that the primary infection may arise from local or more general causes. With regard to the former, septic inflammation around the roots of dead bicuspid and molar teeth forms a very frequent cause of antral suppuration, and from this situation the disease may gradually extend into the ethmoid and frontal sinuses. In the 52 cases from which those recorded were selected, dead

¹ Lancet, Apr. 9, 1904.

² Med. Rec., July 11, 1903.

³ Lancet, May 21, 1904.

or carious teeth were present in each one, and upon the side of the diseased sinus. He states, however, that in some cases this was likely a coincidence, since only small degrees of caries were present, but in a large number the dental trouble seems undoubtedly to have been the cause of the sinus suppuration. With respect to the general etiologic factors it is a well-established fact that many cases of suppuration date from an attack of one of the specific fevers, and of these, influenza has played a very prominent part during recent years. In connection with the chronic suppurative lesions with which we are now concerned 2 important questions demand an answer, namely, what is the risk to life—(1) if the disease is left to take its course? and (2) if operative procedures of a radical nature are undertaken for its relief? With regard to the first question, the risk to life will depend upon the situation of the sinus relative to neighboring structures of vital importance. In the case of the antrum, aside from the evil influence upon the general health induced by constantly swallowing septic matter, there can, practically speaking, be no danger to life. With empyema of the frontal, ethmoid, and sphenoid sinuses the case is very different, and many cases terminating in fatal meningitis have been reported. So long as the drainage from the sinuses remains free, the patient will suffer only from the results of the absorption of septic matter into the general system, and the annoyances caused by the nasal discharge, but, at any rate, a severe cold in the head or the increase in size of polyps or other inflammatory swellings may produce a retention of septic products within the sinus and evil possibilities may at once present themselves. As to the second question, the risk to life when operative treatment is undertaken, will in the main depend on 2 factors: (1) the sinus involved and (2) the surgeon's familiarity not only with the region in which he is working, but also with the many technical details of intranasal manipulation and operation. The maxillary antrum may be operated upon and subjected to very considerable traumatism without any appreciable risk, because it is far removed from any vital structures. Quite the reverse holds in the case of the higher sinuses, and many fatal results have occurred as a direct result of operative interference. These "regrettable occurrences" have generally followed radical procedures upon the frontoethmoid sinuses, and in nearly all the cases which he has been able to investigate, including 2 of his own, the cause of failure may be summed up in 2 words, namely, deficient drainage. Having given a fair trial to the many procedures which have been advocated for the treatment of chronic empyema of the frontoethmoid sinuses, he is in entire accord with those who maintain that only complete obliteration or destruction of the bony cavities offers any prospect of a permanent radical cure.

Radical Treatment of Chronic Suppuration of the Accessory Cavities of the Nose.—H. Luc¹ (Paris), taking up the subject under 4 divisions, deals first with the maxillary sinus, stating that he shares the views expressed on the same subject by Lermoyez, first, that the surgical treatment is to be strictly limited to the chronic forms of the disease;

¹ Trans. Am. Laryngol. Assoc., 1903.

second, that as regards these chronic forms, a distinction is to be admitted between the properly called suppurative sinusitis, caused and kept up by a primitive infection of the mucous membrane of the antrum, soon ending in a fungous degeneration of its tissue, and the maxillary empyema, in which the pus did not originate in this cavity, but simply accumulated in it, its source being either a frontal or a dental abscess. Lermoyez's conclusion, to which Luc states that he was brought by his own experience, is that it is not advisable to adopt the radical operation in any case of chronic abscess of the antrum without having previously attempted to cure it by one or rather several washings of the diseased cavity, after a puncture has been made in the inferior meatus. Without reviewing his formerly described radical operation, he states that his double aim in performing the operation is to make 2 large bony resections: the one at the expense of the anterior wall of the sinus, in order to obtain a wide but transitory communication between the sinus and the mouth, and to remove thoroughly the pus and the diseased mucous membrane; the other at the expense of the internal or nasal wall of the sinus, in order to create a wide and permanent communication between the antrum and the nasal fossa. He lays great emphasis on the fact that the antronasal communication must be a large and permanent one, whereas the antrobuccal one is to last only just as long as is necessary for the cleaning and curetting of the sinusal cavity. The principle of this operation is based on a scrupulous regard for the laws of nature, according to which the sinusal cavities are to communicate with the nose, but not with the mouth. The aim then was simply to substitute for the natural hiatus, so unfavorably situated and so insufficient as regards its size, a considerable opening not amounting to less than the third part of the wall at the expense of which it is made, thus making of the maxillary sinus a sort of lateral prolongation of the corresponding nasal fossa, likely to become cleansed as well as the latter when the patient blows his nose. Secondly, he considers the radical cure of frontal abscess, and observes that while he was the first to advocate the Ogston-Luc method in his own country, he feels some pride that he is now the first to lay stress upon its weak points. Of course, the principle upon which it is based (immediate closing of the frontal wound after thorough cleansing of the sinus, and further and exclusive drainage through the nose) was most tempting, and it is a matter of fact that it was often crowned with a rapid and brilliant success, the patient quickly recovering with a scarcely visible scar. But such were only the favorable cases, and it is our chief duty to consider more attentively the unfavorable ones, from which there is too often observed conditions like the following: about the twentieth day after the operation a swelling appeared in the operated region, ending with a spontaneous reopening of the wound, with the formation of a fistula and with the necessity of a new operation. Things were in this unsatisfactory condition when Killian proposed a new method, which is a sort of combination of the Ogston-Luc with Kuhnt's and Jansen's operations, or rather a combination of the advantages of all 3. In imitation of the Ogston-Luc method it implies the immediate closing of the wound and the

consecutive drainage by the nose. Like Jansen's method, it opens the floor of the sinus. Like Kuhnt's, it removes the greatest part of the anterior wall; but its chief originality consists—(1) in preserving between the two-mentioned breaches a sort of bony bridge corresponding to the orbital arcade, which greatly preserves the normal aspect of the face; (2) in extending the inferior bony opening to the ascending branch of the maxillary bone, which gives to the surgeon hitherto unknown facilities for widening the frontonasal outlet and curetting the ethmoid cells. This he believes to be at present the surest and safest method for the radical cure of chronic frontal suppurations in cases whose surgical treatment is made particularly difficult by abnormal dimensions of the sinusal cavity, and especially by its extension to the temporal region. Under the division of ethmoid cells he states that with the exception of a dubious case in which the region of the middle nasal meatus, presenting itself rhinoscopically filled with creamy pus, while the frontal as well as the maxillary sinus showed themselves perfectly permeable to transillumination, he had no personal record of a single example of an isolated ethmoid suppuration, it being usually found in connection with frontal or maxillary suppuration. He then considers the surgical opening of the ethmoid cells—(1) Through the normal way of the nose; (2) during the maxillary operation; and (3) during the frontal operation. He states that he has abandoned entirely the use of the so-called nasal curet for the removal of the hypertrophy, more or less myxomatous parts of the mucosa, as well as the bony cells themselves, after finding out how powerless those instruments are in either case. He was then led to the practical conclusion that the only instrument likely to deal successfully with the soft and easily bleeding myxomatous tissue, as well as with the honey-combed bony tissue of the ethmoid labyrinth, was best represented by a special forceps the blades of which are large enough to seize much at a time and flat enough to be easily thrust into the deepest and narrowest recesses of the middle meatus. He exhibited the instruments which he had devised, made in 3 sizes. Lastly, like the ethmoid cells, the sphenoid cavity in case of chronic empyema not likely to be cured by such simple means as catheterism and washing can be opened either by the rhinoscopic way or with the help of a previous artificial breach. When no more hindrances are left for getting at the sphenoid front wall than the middle turbinal and the posterior ethmoid cells, he thinks there can be no simpler method for reaching and opening the concerned sinus than the same which he describes for the intranasal curetting of the ethmoid cells. However, should there be an antral empyema with the sphenoid suppuration, there should be no hesitation as to the choice of the best way to be followed in order to get at the sphenoid cavity, the antral opening being the one that is safest and easiest.

Leukemic Infiltration of the Accessory Sinuses.—K. M. Menzel¹ describes an interesting condition of the mucous membrane of the accessory sinuses in leukemia, in which, instead of a smooth lining, the sphenoid sinus was clothed with a white membrane, presenting some 50 to

¹ *Zeit. f. klin. Med.*, vol. li, Nos. 3 and 4.

60 distinct protuberances between which there were extensive hemorrhages. All signs of inflammation were absent. This condition is of importance, as it may explain the uncontrollable epistaxis of leukemia.

Headache from Nonsuppurative Inflammation of the Accessory Sinuses of the Nose.—Robertson¹ believes that headache from disturbance of the air-pressure in the accessory sinuses of the nose is not so rare as might be supposed, and there are present in such cases all the symptoms of an empyema except the discharge. The cause of this condition has been stated to be due to increased air-pressure in the sinus, but Robertson believes it to be due to a lack of pressure. This diminution in pressure is caused by obstruction to the ingress of air to the sinus by closure of its natural orifice. For instance, the middle turbinate may be swollen from inflammation to such an extent that the sinus is obstructed and the cavity thereby shut off from the nasal chamber; the retained air in such instance loses its oxygen from absorption, the pressure on the mucous membrane is lessened by rarefaction of the air contained in the cavity, causing a swelling of the mucous membrane in the sinus. If the opening becomes patent, the condition subsides, but in cases where the opening remains closed for some time, the cavity is encroached upon, first, by the swelling of the mucous membrane, second, by pouring out into the cavity of lymph, and third, by engorgement of the mucous membrane itself by lymph. The same condition exists here as in the nonsuppurative inflammations of the ear caused by occlusion of the eustachian tube. The symptoms thus arising vary according to the time the sinuses remain closed. Cases may present intermittent symptoms from occasional opening of the sinus by contraction of the tissues of the middle turbinate. Two cases are reported in detail.

Empyema of the Antrum.—H. Knochenstiern² reports a case of empyema of the antrum which could clearly be demonstrated as having been caused by a decayed tooth, an etiologic factor which is accepted by but few writers. The patient had suffered from a very fetid nasal discharge for some years; a close examination revealed the 2 bicusps decayed. They were removed, as well as a portion of the maxilla above them. The antrum was found to consist of 2 cavities, which communicated with each other. The outer, smaller one showed caries; the inner, nasal one contained some pus, but was, on the whole, quite healthy. Removal of the diseased structure and thorough drainage were followed by complete recovery.

Self-retaining Drainage-tube and Pilot for the Maxillary Antrum.—Lawrie McGavin³ (London) writes: The operation of draining the maxillary antrum is one of those which is usually performed under the influence of nitrous oxid anesthesia, and, so far as the drilling of a hole into that cavity is concerned, is a very simple matter. The introduction of the drainage-tube is, however, at times quite the re-

¹ Jour. Am. Med. Assoc., Mar. 5, 1904.

² St. Petersburg. med. Woch., 1903, xxviii, 115.

³ Brit. Med. Jour., Apr. 16, 1904.

verse, especially when the tube used is one of fine spiral silver wire and the patient is struggling forcibly; for as soon as the drill is withdrawn, the mucous membrane of the gums falls together over the hole, and the entrance of the tube is at once obstructed. In order to overcome these difficulties he suggests the use of the drainage-tubes and pilot shown in the accompanying diagram (Fig. 60). Each tube is provided with a small metal tongue, which stands out from it and holds it in position. The pilots all fitting the same handle are made with a waist just below

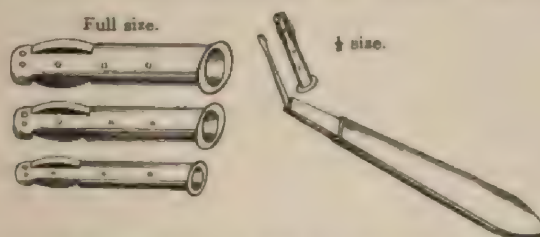


Fig. 60.—McGavin's self-retaining tube and pilot for the maxillary antrum (*Brit. Med. Jour.*, Apr. 16, 1904).

the head to allow of the recession of the metal tongues during the insertion or withdrawal of the tubes.

India-rubber Antrum Plug.—Claud Woakes¹ (London) reports satisfactory results in antrum drainage following the use of a solid india-rubber plug in sizes corresponding to the English catheter gage Nos. 3 to 12, and finds them more comfortable and satisfactory than the hollow metal tubes (Fig. 61). The round shield on the base can be cut to any shape, allowing them to be used both for the operation through the alveolar process and above in the canine fossa. After the operation opening has closed to the required size, the plug is inserted, the shield being cut wherever it appears to press uncomfortably. The patient is then allowed to use a Higginson syringe with a soft catheter attached, corresponding in size to the plug selected, and allowed to wash the cavity out daily.

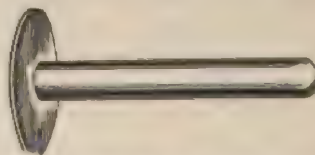


Fig. 61.—Woakes' india-rubber antrum plug (*Lancet*, Mar. 19, 1904).

Reflex Cardiac Inhibition Resulting from Irritation of the Peripheral Fibers of the Trifacial Nerve and Occurring in the Course of an Operation for Chronic Empyema of the Frontal Sinus.—George Fetterolf² (Philadelphia) states that in the course of operations on the upper air-passages, in regions supplied by the terminal fibers of the fifth cranial nerve, he had at times noticed an embarrassment of the circulatory apparatus which was entirely out of proportion to the severity of the operation or the general condition of the patient; it was not, however, until the patient whose case is reported came to the table that the true meaning of the condition occurred to him. On look-

¹ *Lancet*, Mar. 19, 1904.

² *Amer. Med.*, Mar. 19, 1904.

ing up the literature and working out an explanation of the phenomenon he elicited several points which proved to be of practical as well as of scientific interest to those working in rhinolaryngologic fields. The interesting feature of the operation, which is described in detail, was the occurrence of a trigeminocardioinhibitory reflex. Each time the curet would be applied to the sinus wall there was a marked diminution in the force, fulness, and frequency of the pulse, along with distinct cyanosis. The cureting had, therefore, to be frequently interrupted. This phenomenon has occasionally been noted in operations involving areas supplied by the fifth nerve, and especially by dentists. The particular area of the fifth nerve involved in this case was, of course, the mucosa of the sinus. In none of the standard text-books on anatomy is there any description of the nerve-supply of this region. However, it must unquestionably be from the trifacial, and the examination of a number of skulls justifies the belief that the principal source is from the supraorbital, with possibly additional filaments from the nasal and the malar branch of the temporo-malar. The path of the impulse is clear. It runs through the afferent fibers of the fifth to the gasserian ganglion, then through the fibers of the sensory root to the deep origin, which comprises the sensory nuclei in the floor of the fourth ventricle and the gray substance of the substantia gelatinosa of Rolando as far down as the second cervical nerve. From these situations the path to the nucleus ambiguus, which contains the motor centers of the vagus, is short and direct, and is probably through some of the fibers of the posterior longitudinal bundle. Normally the relations between the nuclei of the fifth and tenth cranial nerves are directed and controlled by centers situated higher up. This control is usually not materially interfered with during ether anesthesia, but when chloroform is used, the connecting fibers between the two deep origins are given much freer play, and, as a consequence, any irritation of the peripheral fibers of the trigeminus may produce, through the cardioinhibitory fibers of the vagus, an amount of disturbance which may vary from only a slight degree of embarrassment to actual cessation of the heart's action. In this way may be explained some of those deplorable accidents which have occurred during adenoid and dental operations, and a safe rule to follow would never be to use chloroform when the area about to be operated upon is supplied by sensory fibers of the fifth nerve. The occurrence of a reflex in aural manipulations is of much greater frequency and has often been noted.

Chronic Sphenoid Sinusitis.—Albert E. Rogers¹ (Boston) believes that a chronic sphenoid sinusitis occurs much more frequently than is generally supposed. He reports 11 cases observed in the Massachusetts General Hospital, and makes observations gathered from the hospital statistics. Of 600 out-patients examined, 29, or nearly 5 %, had accessory sinus disease. Of these, the antrum of Highmore was affected in 4, the frontal sinus once, a mixed frontal and ethmoid 2, the anterior ethmoid 3, the posterior ethmoid 2, and the sphenoid sinus 16. He

¹ Boston M. and S. Jour., Dec. 31, 1903.

notes that in the review of literature Grünwald reports a larger percentage of sphenoid cases than others, having opened 51 sphenoid sinuses and only 14 frontal. In examining the sinus he passes the probe in a direct continuation of the line from the inferior nasal spine to the middle part of the middle turbinate, and it must not go anterior to this line. The distance from the inferior nasal spine to the anterior sphenoid wall is about 7.5 cm. If the probe goes a greater distance, it is either in the sphenoid sinus, brain cavity, or nasopharynx. He describes the operation as follows: After thoroughly cocainizing the nose, a piece of the anterior portion of the middle turbinate is removed with a Knight's cutting forceps (Fig. 62, 2). Then, with the same forceps, the body of the turbinate is grasped and bent toward the outer wall, when, by quickly twisting it in the opposite direction, it is fractured along its attachment. The forceps, still grasping the bone, is now removed, and usually the whole turbinate comes away, leaving a free and easy approach to the sphenoid opening. The hemorrhage is generally brisk at this time, but it is not of long duration and further bleeding is exceptional. He does not use adrenalin solution at the time of the removal of the

turbinate, but for after-treatment gives the patient a spray of 1:1000 solution to use twice a day for 10 days, at which time the sinus is opened. Under cocain anesthesia he employs a forceps constructed on the principle of Grünwald's downward cutting forceps, but with shorter jaws, fenestrated and with a stouter rivet at the joint. He also employs a strengthening clasp placed at the joint (Fig. 62, 1). After the forceps has entered the nose its jaws are slightly opened, and while paying attention to the upper jaw only, the instrument is passed into the sphenoid

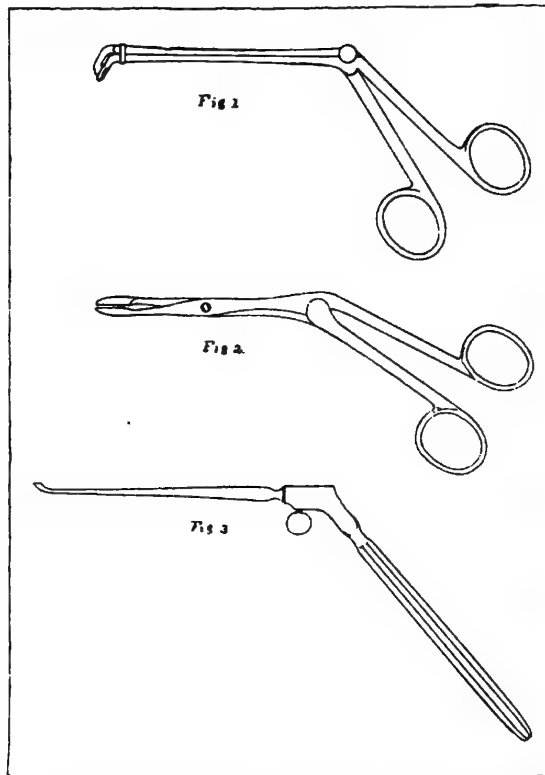


Fig. 62.—Fig. 1, Rogers' forceps; Fig. 2, Knight's cutting forceps; Fig. 3, Hajek's sphenoid hook (Rogers, in Boston M. and S. Jour., Dec. 31, 1903).

noid opening in the same manner as the probe. The jaws are then brought together with firm pressure, biting out the anterior wall and establishing free drainage. When the opening is too small to admit the forceps, he first enlarges it by means of Hajek's sphenoid hook (Fig. 62, 3). In 2 cases only has he found it necessary to curet and syringe out the cavity. By this method complete relief was obtained in the 11 cases reported.

DISEASES OF NASOPHARYNX, PHARYNX, AND PALATE.

A Retrospect of Personal Experience of the Removal of Post-nasal Growths.—The *Intercolonial Medical Journal of Australasia*¹ published under this title articles by A. J. Brady (Sydney), James W. Barrett (Melbourne), J. Lockhart Gibson (Brisbane, Queensland), and T. K. Hamilton. Brady states that during the past 10 years of his service in the Sydney Hospital the total number of operations for adenoids in which **general anesthesia** was employed is 2094, while in his private practice during 17 years the number is something over 1200. For a number of years he has used Hartmann's ring knife for cases under general anesthesia, and various cutting forceps, guided by the mirror, under local anesthesia. In recent years, however, he has employed the Beckmann-Gottstein curet in both cases. From his observations he has long been of the opinion that the injurious effects of the growths are not produced altogether by merely mechanic means. The mental dulness, the impaired general nutrition, and the pale, unhealthy complexion are not found in the subjects of nasal obstruction from other causes, such as deflected septum, etc. It is highly probable that the ring of adenoid tissue in the nasopharynx and throat, like the thyroid gland in the neck, affords an internal secretion to the economy. In the former, as in the latter, case, in physiologic quantity, this secretion is necessary; in the former, particularly during the growth of the body, when this material is in excess it is injurious, as in the case of the thyroid gland. Whether the material is of the nature of cell-elements or a special secretion, a form of autointoxication is produced in the subjects of excessive adenoid development.

Barrett observes that when he began work in London in 1883 the **removal of adenoids was not generally practised**. It will be remembered that Meyer's discovery was made known in 1868. It represents another remarkable instance of capacity to group impressions in a new way. Aurists recognized that deaf people and especially deaf children are apt to keep their mouths open. Attempts were made to explain this fact on the ground that it permitted the sound-waves more readily to reach the ear through the eustachian tube. Meyer simply recognized that children keep their mouths open because they cannot breathe through the nose, and grasped the fact that there was a relationship between this nasal obstruction and the deafness. It may be recollected, too, that in opposing the hostile criticism with which his discovery was received, he took great trouble to meet the objection that if this were

¹ Sept. 20, 1903.

such a common disease and its results so serious, it must have been recognized long since; therefore it could not have existed. He showed, by a search through the picture-galleries and statue galleries of Europe, that there were numerous instances in the representation of historic characters, of appearances which suggested postnasal growths, and that in some of them deafness had been incidentally recorded. Between 1880 and 1890 the operation for their removal became more generally practised. The conservative opposition to it slowly gave way, and was followed by a swing of the pendulum in the other direction. Adenoids were removed on a scale and in a manner which was more the product of enthusiasm than of deliberation. After reviewing the various methods of operation, instruments used, complications, sequels, and the method which he himself has adopted, he closes by saying that after an experience with some thousands of cases, one can see that its chief danger lies in the anesthetic, the more particularly if that anesthetic is chloroform, when the mortality for so small an operation has been fairly high. With the substitution of gas or gas and ether for chloroform, and with reasonable precautions taken against hemorrhage, including the avoidance of operation as far as possible in hemophilic patients, the mortality should be reduced to negligible proportions. It is the custom of human beings to erect monuments and in various other ways to honor the memory of those who have conferred some signal service on mankind. If those services are to be measured by their immediate practical consequences, in all probability no one has conferred greater benefit on the human family and is more worthy of an honored recollection than Wilhelm Meyer.

Gibson begins his article by **classifying his operations** into: (1) Infants from a few weeks old to about 2 years: no anesthesia; unarmed finger. (2) Children under 14 years: complete chloroform anesthesia; supported hanging-head position or rectangular head position. Special steel nail, made especially for the finger which is to use it, admitting sense of touch during the whole operation. (3) Children above 14 years and adults: cocaine anesthesia, at times combined with adrenalin; sitting posture; tied forward palate; Lowenberg's and Hovell's forceps, guided entirely by sense of sight. He believes the best general anesthetic to be chloroform. He emphasizes his preference for the supported hanging-head position for operation under general anesthesia. He recognizes 3 kinds of hypertrophy: (1) The soft are the largest growths. They come away fairly easily, and the difficulty of breathing is the most pronounced symptom. Considering their bulk, they cause comparatively less ear trouble than the other 2 varieties. (2) The crisp growths are firm, not, as a rule, so large, exert more pressure on the eustachian prominences, break down readily almost into fine porridge when operated upon. (3) The tough are sometimes large growths, but often comparatively small. They appear to exert firm pressure on the eustachian prominences, and to cause the most troublesome ear conditions. They are answerable for a majority of the cases of incurable deafness from post-nasal growths. Under operation they come away in considerable pieces, require time for their removal, and are composed of a large proportion of fibrous tissue.

Hamilton takes up the aspect of adenoids in its relation to other diseases, particularly ear complications. He states that the close connection between adenoids and trachoma is now well established, a fact which is not hard to believe, seeing that there is not only an anatomic connection between the nose, the accessory cavities, and the eye—a vascular anastomosis of vessels in these cavities, and the lymphatics of the nose and eye meet in the pharynx—but also that the same etiologic factors are at work in each affection, viz., poor environment, bad hygiene, etc. Of the dyscrasias and diatheses with which we are concerned in connection with postnasal growths, lymphatism, inherited syphilis, and tuberculosis are the principal. After observing the changes which these growths undergo in adults, he believes that we can classify all cases of growths seen after puberty pathologically into 2 groups: (1) Those in which a process of fibrosis takes place, which results in their shrinkage; this process commences at puberty and goes on progressively for some years. (2) Those in which there is no fibrous tissue proliferation, therefore no tendency to sclerotic changes. It is in these cases that removal is most necessary and the results most satisfactory.

The Removal of a Nasopharyngeal Polyp by a New Operation.

—A. Depage¹ reports the removal of a nasopharyngeal polyp with favorable results in a young man of 18. The tumor produced a swelling on the right side of the face and also some exophthalmos. The tumor forced its way forward into the left nasal cavity and was adherent to the base of the skull and the pterygoid process. The prominence in the temporal region and the exophthalmos showed that the neoplasm projected into the zygomatic fossa and into the orbit through the sphenomaxillary fissure. The patient breathed through the mouth. The left nostril was completely obstructed, while the passage through the right nostril was not entirely obstructed. The operation was first preceded by tracheotomy. The patient was put in the position of Rose and the mouth fixed open. By means of a long chisel passed along the nares the tumor was detached from the base of the skull and the pterygoid process. Hemorrhage was abundant, and necessitated the provisional tamponing of the nasopharynx. A vertical incision about 5 cm. (2 in.) long was then made on the mucous membrane of the jaw in front of the ascending ramus. The tumor was separated as far as possible by means of the index-finger introduced into the incision. The tampon was removed, and the tumor then removed by traction. Three months after the operation it was difficult to observe any trace of the operation whatever. The tumor was the size of a turkey's egg, and composed of fibrous tissue and blood-vessels, which accounted for the profuse hemorrhage during the operation.

Tertiary Lesions in the Nasopharynx.—Dien² divides gummas in the nasopharynx into 2 classes: (1) Those beginning in the periosteum, etc., and (2) those beginning in the mucosa, and devotes his paper to the latter class. The principal symptoms mentioned after the disease becomes well marked are nasal obstruction, more or less deafness, usu-

¹ Jour. de Méd. de Brux., 1903, No. 24, p. 372.

² Rev. hebdom. de Laryngol., Sept. 19, 1903.

ally unilateral, dysphagia and headache, the intensity of each symptom varying with the position of the gumma and the extent of the ulceration. By the use of the rhinoscopic mirror a gumma may require to be differentiated from nasopharyngeal fibroma, sarcoma, tuberculous abscess, cyst of the vault, and acute adenoiditis. Fibroma and sarcoma may occur early in life, when tertiary syphilis is rare; the fibroma may be extremely hard and bleed readily; sarcoma grows quickly and bleeds readily, the diagnosis between the two often depending on the therapeutic test. In syphilis, however, bleeding is rare. Tuberculous abscess is distinguished by its extreme pallor; a cyst can be diagnosed by palpation; while from adenoiditis syphilis is distinguished by lack of fever.

Epidemic Sore Throat from Suppurative Mammitis in Cows.—

French¹ reports an epidemic of sore throat which had occurred on 3 occasions and was found to be due to the consumption of curdled milk, sometimes containing pus, which had been drawn from the udders of cows suffering from mammitis. He states that the attack begins by chilliness, malaise, and soreness about the throat within 24 hours after infection, the appearance being that of lacunar tonsillitis or quinsy, but not of diphtheria. The glands of the neck become enlarged and indurated, and in rare instances suppuration occurs. Neuralgic pain is nearly always present. The temperature may rise to 103° F., or even, as was noted in one case, to 107° F. Among complications noted were swelling of the limbs and joints resembling rheumatism, the presence of a rash in some cases, and occasionally erysipelas of the head and face. Fatal terminations were rare, though a recrudescence of symptoms is quite common. In the treatment of the disease all the ordinary methods employed for the alleviation of sore throat were found to be ineffectual, but injection of antistreptococcic serum was immediately followed by good results; the temperature became normal within 12 hours and rapid recovery followed. Bacterial examination revealed the presence of numerous streptococci, and although there were some bacilli present, cultures produced only a repetition of the same germ. From these observations he concluded that the disease must be considered as an erysipelatos infection of the throat caused by these microorganisms; that they may eventually cause general septic infection and that they also have a toxic effect on the nerves producing the neuralgia.

Treatment of Chronic Hypertrophic Pharyngitis by Scarifications.—Escot² (Toulouse) has adopted this method of treating that obstinate form of pharyngitis found in neuroarthritic subjects, characterized by hypertrophy of the chorion of the mucous membrane, hypertrophy of the constrictor muscles, pain on swallowing, constant discomfort, and hypersecretion. With an 8-pointed scarifier he attacks the soft palate and anterior faucial pillars and scarifies first horizontally and then vertically, allowing the bleeding to check spontaneously. Iodized phenol or zinc chlorid solution is then applied 10 or 15 days later. The posterior pillars and pharyngeal wall are similarly treated. The good effects are appreciable at the end of 1 or 2 months.

¹ Brit. Med. Jour., Apr. 9, 1904.

² Arch. Int. de Laryngol., 1903.

The Operation for Cleft Palate.—C. P. Childe¹ states that the patient should be placed in the horizontal position, with the head steadied over a firm pillow at the end of a table, the surgeon standing behind. Troublesome hemorrhage is avoided by separating the mucoperiosteal flaps rapidly while an assistant sponges the blood away. The flaps having been separated and freely pared, a small Hagedorn needle-holder and a very small circular needle are used for closing. Fishgut or the finest horsehair for the uvula and stouter for the palate answer well for the sutures. They are passed in the following manner: The tip of the right half of the uvula is lightly held in a pair of long forceps, and a small semicircular needle in a small Hagedorn holder, threaded with the finest silkwormgut, is passed from before backward through its base and out in the cleft. The needle is released and drawn through. It is then readjusted in the holder, the tip of the left uvula is similarly held, and the needle is passed in the cleft and brought out from behind forward, transfixing the base of the left half of the uvula. This suture and a second one similarly placed serve to steady and to stretch the flaps and to bring them together, while the remainder are introduced from behind forward. After 2 or 3 sutures have been placed in this way the lips of the flap can be held so close together by drawing gently on them that the remaining sutures can be passed across both flaps, as in stitching any wound with the interrupted suture and without bringing the needle out of the cleft. Childe has had good success in passing the sutures after this method.

Age for Operating in Cleft Palate.—R. W. Murray² asserts that if cleft palate involves the soft parts only, this may be closed at any time before the child begins to speak with almost complete assurance that articulation will be perfect. The same is true in harelip when this exists alone, but if the cleft palate involves any portion of the hard palate or the alveolar arch, although by operation a complete closure may be effected, articulation and phonation can never be made perfect. This, he believes, is due to the fact that in a defective hard palate there is necessarily a defective nasal chamber, which in the normal condition is largely utilized in effecting phonation. As illustration of the correctness of his view he cites the fact that many children with highly arched palates have defective phonation and articulation. He holds that operation should be performed at some time between birth and the end of the second year, and prefers that it be deferred until toward the end of the second year, since the increased strength of the child gives better hope of recovery. In the discussion, Arbuthnot Lane held that he preferred operation at the earliest possible moment, usually performing it the day after birth. His reasons were that the nasopharynx was sooner exposed to the influences of the mechanic factor upon which its development depends; that operation is easier and more certainly successful at this age, because of the absence of teeth and the better flap obtained; and that the child at this age displays no annoyance or irritation following the operation.

The Relation of Nontuberculous Diseases of the Upper Air-

¹ Brit. Med. Jour., July 4, 1903.

² Brit. Med. Jour., Aug. 29, 1903.

passage to Phthisis.—Moeller and Rappoport¹ attribute great importance to diseases of the upper air-passages in their relation to the invasion of the lungs by tuberculous infection. They attribute little importance to the air-warming function usually ascribed to the nasal mucous membrane, since air entering by the mouth is of the same temperature as that entering the lungs through the nose; the moisture received by the air in passing through a healthy nose is a factor to be considered, since it prevents the air from irritating the delicate epithelium of the lower air-passages. The most important function is that of cleansing, by means of mucous secretion, the incoming air, which is laden with various germs and small foreign bodies. Chronic rhinitis, polyps, deviations of the septum, crests and spines, and any character of growth or swelling which might lead to mouth-breathing should receive attention, since in all such cases there is apt to be chronic irritation of the mucous membrane of the pharynx, larynx, trachea, and bronchi. One of the most frequent predisposing factors to phthisis is ozena. Alexander found in 50 such cases that 22 were infected with tuberculosis and 7 other doubtful ones. The same author found, by the records of postmortem examinations in 22 cases, that 68 % showed pulmonary involvement. Thus we find that the organ which should serve as a filtering apparatus to protect the more delicate pulmonary structures becomes a focus of infection and a culture-field for the harboring of these virulent organisms. The authors of this paper report 120 cases of phthisical patients, of whom 84 % had disease of the nose, 76 % of the pharynx, 42 % of the larynx, and 26 % of the ears. It is stated that the ear disease may probably in many cases have been secondary to the nasal lesion. In one case it was noted that there were 20 different varieties of bacilli. In investigating the virulence of the germs found in the healthy nose and from patients suffering with coryza, the only appreciable difference was that of quantity. Friedländer's bacillus was in some instances obtained almost in pure culture from cases of ozena.

A Head-rest for Postnasal Operations.—F. A. Nyulasy² (Melbourne) suggests the head-rest here figured as one convenient in the removal of postnasal growths and for operations within the nostrils. The "hanging-head" position over the end of the table as ordinarily maintained he thinks seriously impedes respiration, owing to the extremely strained condition of the anterior neck muscles. This head-rest overcomes that difficulty and dispenses with the need of an assistant to steady and support the patient's head. The operator sits at the end of the table beyond the patient, and does his work in a more deliberate, satisfactory, and safe manner than is possible by other methods, while at the same time the risk from any anesthetic is considerably diminished. The head-rest is easily clamped onto the end of an ordinary kitchen-table and may be easily raised or lowered (Fig. 63).

An Inspiratory Nasal Irrigator (Fig. 64).—Dundas Grant³ (London) writes: The central idea in this simple apparatus is the more effec-

¹Zeit. f. Tuberk. und Heilstt., July, 1903. ²Brit. Med. Jour., Apr. 30, 1904.

³Brit. Med. Jour., Mar. 26, 1904.

tive employment of the action of "snuffing" in the irrigation of the nasal passages. The apparatus consists of a cylindric glass receptacle—a neckless bottle—of about 2 ounces in capacity, fitted with a cork bung through which pass two tubes, one of which reaches to the bottom of the receptacle, the other for a very short distance below the cork.

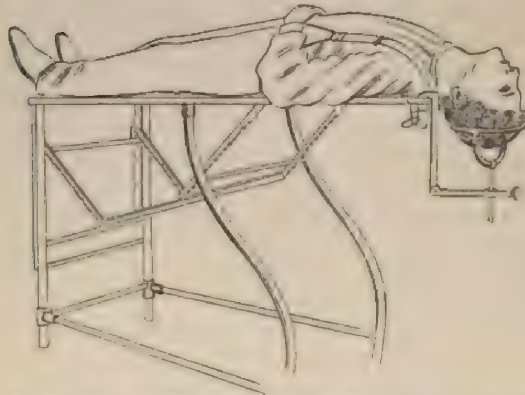


Fig. 63.—Head-rest for postnasal operations (Nyulasy, in Brit. Med. Jour., Apr. 30, 1904).



Fig. 64.—Grant's inspiratory nasal irrigator (Brit. Med. Jour., Mar. 26, 1904).

The long tube has at its upper extremity a flattened, bulbous expansion adapted to fit the nostril. The mode of employing the irrigator is extremely simple. It is filled with the necessary liquid, and held in the hand of the side on which it is to be used. The bulbous tip is placed in the nostril, and the *alæ nasi* of both sides are compressed by means

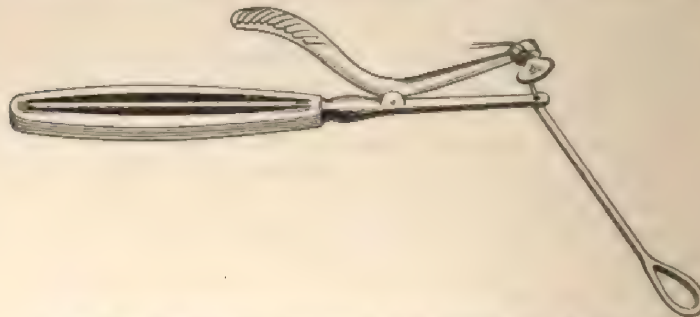


Fig. 65.—MacDonald's postturbinal snare (Lancet, Apr. 23, 1904).

of the thumb and fingers of the opposite hand. The patient then, by a vigorous snuffing action, draws the liquid up his nose into the nasopharynx. The instrument ought then to be removed from the nose, while the fluid in the nasopharynx is hawked through the mouth. The advantages claimed for this irrigator are that the action of the *vis à*

fronte reduces the risk of invasion of the eustachian tubes, that the stream is drawn upward as well as backward, and thereby reaches the middle turbinal and middle meatus, while at the same time the forcible inspiration forms a gymnastic exercise for the breathing mechanism which in many cases is of great value.

Postturbinal Snare.—Mackay MacDonald¹ (London) has designed the snare herein illustrated (Fig. 65) to facilitate the removal of the posterior ends of the inferior turbinals without a general anesthetic and without the insertion of the finger into the postnasal space. The wire loop runs in the rigid grooved loop, the groove being continuous with the barrel of the snare. There is a stop in the barrel to prevent the severed posterior end dropping off the wire.

DISEASES OF THE TONSILS.

A Note on Tonsillar Enlargements and Their Treatment.—

Lawrie H. McGavin² (London), in the beginning of his paper, sums up the uses of the tonsils as follows: First and chiefly they must be looked upon as the scavengers of the oropharynx, in support of which view the following points may be mentioned: (1) Their position at the back of the mouth, where the movements of the tongue are least efficacious in cleansing the buccal cavity, points to the necessity of their presence there. (2) Placed between the 2 constrictors of the oropharyngeal space, they must be acted upon by them in 2 ways—first, by being carried by them toward the middle of the space, and, secondly, by being forcibly squeezed between them during their contraction. Thus the bolus of food in its passage to the pharynx is compressed between the faucial and lingual tonsils at the oropharyngeal ring, and is thus probably denuded to a great extent of surface bacteria, the compression of the tonsil at the same time possibly serving to cause the exudation of a protective film of lymph by which any organisms may be rendered innocuous during the subsequent passage over the posterior surface of the arytenoid cartilages. (3) The fact that the tonsil is a lymphatic gland placed in a septic cavity, and that it is in direct communication with that cavity, suggests that its duty is that of rapid phagocytosis without the mediation of lymphatic vessels. (4) The presence of so much lymphatic tissue, of which the faucial tonsils form only a portion, in the oropharynx is evidence of the necessity for protection against bacterial invasion in this situation. That the tonsils undergo atrophy in later life is no argument against their supposed protective function, for when the marked predisposition to the exanthemas, diphtheria, and other infectious states in young children is considered, as opposed to the comparative immunity from such in later years, it is in the natural order of events that, their presence being no longer required, they should to some extent disappear. Granted, then, that the tonsils have at least one known duty to perform, and possibly others unknown, their condition is deserving of careful consideration before their removal

¹ Lancet, Apr. 23, 1904.

² Lancet, Sept. 26, 1903.

is determined upon; otherwise their surgery is debased to the level of unscientific and meddling interference. Of the many causes of tonsillar enlargement, there are 1 or 2 to which attention must be drawn as being those in which mistakes are most commonly made, and in which it is desirable to indicate some definite line of treatment. He makes 3 divisions of enlargement: (1) Simple enlargement, or hypertrophy of the tonsil. The enlargement of such tonsils he states probably does not depend upon any chronic irritation, but is the outcome of some tendency to a general hypertrophy of the parenchyma of the gland, the various constituent parts of the organ maintaining their respective proportions to each other. In short, the enlargement is a true hypertrophy and not a hyperplasia. (2) Enlargement due to continued irritation. Here one may describe 2 classes of tonsils, namely, that which is in the early stage of inflammation, and that which is affected by the changes produced by chronic inflammation—in other words, a hyperplastic tonsil, produced most commonly perhaps by nasal insufficiency or nasopharyngeal obstruction. (3) Enlargement accompanied by lacunar inflammation. The purpose of the tonsillar crypts or lacunae appears to be uncertain, though it would seem that they were designed to increase the superficial area of the tonsillar epithelium for absorptive and secretive purposes, invagination replacing external reduplication, with the object of economizing space in the oropharynx. That the crypts are not an unmixed blessing, however, is shown by the readiness with which they become the seat of chronic inflammation or the receptacles of small foreign bodies. He summarizes as follows the conditions which call for total ablation of the tonsils and those in which conservative treatment may be reasonably expected to succeed: Tonsillectomy is indicated in lacunar disease in the following conditions: (1) Where the whole tonsil is extensively diseased; (2) when the crypts involved, although few in number, are situated at the upper part of the tonsil and upon the mouth of a deep supratonsillar fossa; (3) where the crypts, although few, are involved, occur upon a hard, anemic, and rugose tonsil, and contain lacunar plugs which are cretaceous and extremely foul; (4) when the disease occurs in young children, who will rarely permit of any prolonged manipulation in the mouth; (5) when the condition is accompanied by cervical glandular enlargement; (6) when cauterization has already been tried and has failed. In the following cases he recommends dilation of the orifices, evacuation of the contents, and cauterization of the crypts: (1) When the diseased crypts are neither numerous nor large; (2) when the upper part of the tonsil is healthy and the supratonsillar fossa is shallow; (3) when the disease occurs in young adults and has not been of long standing.

Primary Gangrene of the Tonsil.—E. Oberwarth¹ points out that one must distinguish between this condition and secondary gangrene occurring in the course of the infective affections, such as diphtheria, scarlatina, etc. Primary gangrene is a separate disease *sui generis*. He reviews the literature on the subject and reports the following case: On

¹ Deut. med. Woch., Apr. 23 and 30, 1903.

November 22, 1902, a boy of 12 came for treatment at the hospital, complaining of pain in the throat and ear on the left side. Three weeks previously he had suffered from a similar pain on the right side, which had disappeared spontaneously. On examination, the left tonsil was found to be reddened in its anterior portion, from which there exuded a yellowish, slimy, foul secretion, which also covered the posterior pillar of the palate and which had led to deep ulceration of the palate and superficial ulceration of the uvula. Besides this there was a deep ulcer in the posterior portion of the left tonsil. He had a temperature of 102° F. The throat was treated with a gargle and cauterized with 10 % chromic acid, and 10 days later the local symptoms had cleared up and the patient felt better. In another 10 days a whitish exudate appeared on the posterior pole of the right tonsil, and the general condition again became worse. On December 28 some very offensive shreds were cast off, the heart showed signs of distress, and petechias appeared on the arms, legs, and trunk. The spleen also was found to be enlarged. By January 15 the local throat signs had cleared up, though a few days later the pain in the neck returned, the sputum being blood-stained, and fresh petechias appeared. On January 18 the patient was admitted to the hospital as an in-patient, his general condition being very bad. There was extreme pallor, a systolic murmur over the apex and pulmonary area, the apex-beat of the heart was in the nipple-line, in the fourth space, and the limits of dulness were normal. Both spleen and kidneys were palpably enlarged, although there was no albuminuria. On February 7 the general and local signs had improved greatly, but on the sixteenth a dense, bluish-black, and painful area was found on the under lip and right cheek, there being also a retinal hemorrhage on the left side, and the blood showed a considerable increase of the colorless elements. The left tonsil next became necrotic, and a foul odor exhaled from the mouth. February 26 the patient died in a state of extreme sepsis. At no time were there any diphtheria bacilli in the fauces, and the portions of tissue examined after the necropsy revealed only streptococci. The post-mortem diagnosis was as follows: Pharyngitis, laryngitis, amygdalitis necrotica (noma), fatty metamorphosis of the myocardium, and a dilation of the right ventricle, petechial hemorrhages in the endocardium, pericardium, pelvis of kidney, mucosa of stomach, bronchopneumonia, parenchymatous nephritis, etc. The points of importance in the case, as illustrating the type of disease, are thus given: The course being divided into several stages, which are separated by intervals of more or less complete recovery. In this case there were 5 distinct stages, each one being more severe than the one preceding, only the latter producing marked general signs of septic poisoning. The intolerable fetor from the mouth is characteristic of this disease, and is likened to a fecal odor. Cutaneous and other petechial hemorrhages are also characteristic. Oberwarth was in doubt as to whether or not the streptococci found in the fauces were the causal organisms.

The Abortive Treatment of Tonsillitis.—Jordan¹ recommends the

¹ Orvosi Hetilap, 1903; Monats. f. Ohrenheilk., Jan., 1904.

administration of quinin sulfate in tonsillitis, and believes its action to be as specific in this disease as it is in malaria. The quinin is given only at night, a half dram at 7 and a half dram a half-hour later. The following day the patient is without fever, and by evening will have fully recovered. That the quinin does not have any prophylactic action Jordan believes to be illustrated by one of his cases in which there was an involvement of the right tonsil with high temperature in the evening. Following the administration of the quinin there was a normal temperature in the morning, while the same evening there was an involvement of the left tonsil, with high temperature, which again yielded to the administration of quinin, with the final result that there was no recurrence of the trouble. Jordan also claims that this treatment is of value as a diagnostic agent in differentiating tonsillitis from diphtheria and scarlatinal anginas, as the quinin does not exert any influence on the last two.

Lipoma of the Tonsil.—Clement F. Theisen¹ reports a case of lipoma of the tonsil. The patient was a girl, aged 8 years, and had been troubled with severe paroxysmal cough for several years. The

growth was compressible, but did not fluctuate, was yellow in color, and attached by a pedicle to one of the crypts of the tonsil. It was easily removed by being cut off near the tonsil with a pair of scissors. The



Fig. 66.—Tonsil snare (Spratt, in Amer. Med., Jan. 30, 1904).

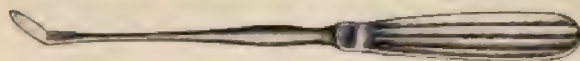


Fig. 67.—Tonsil separator (Spratt, in Amer. Med., Jan. 30, 1904).

microscopic examination proved it to be a lipoma. There have been 6 cases reported in which the diagnosis has been confirmed by microscopic examination. They were found at various ages; all were pedunculated and easily removed, and were attached to the tonsil. It is generally considered to be a congenital affection, more especially as there are no fat-cells found in the tonsil.

An Improved Snare for the Removal of the Faucial Tonsil.—Charles Nelson Spratt² (Minneapolis) gives an illustration of a newly devised tonsil snare (Fig. 66) for which he claims the following points of superiority over the tonsillotome: (1) The instrument is just as convenient and simple in action as the tonsillotome, but is without its dangers. (2) As the tonsil is forced through the fenestrum by the pressure of the ring on the tissue about the gland, the use of the vulsellum forceps is unnecessary and the operation may be done by the sense of touch. (3) The instrument does not require rewiring during the operation. He states in a note that the illustration of the snare herein given (Fig. 66) shows the screw-wheel entirely too large, giving it a rather clumsy appearance. The instrument is similar to the tonsillotome, the sharp blade being replaced by a wire

¹ Laryngoscope, Aug., 1903.

² Amer. Med., Jan. 30, 1904.

loop which rests in a groove in the ring and is not exposed until the slide on the handle is pulled. A pin in the instrument just back of this prevents the wire being pulled into the cannula, which obviates the inconvenience of rewiring the instrument each time it is used. All that is necessary is to reform the loop and place in the groove. If the tissue is very fibrous, the screw-wheel will bring sufficient tension on the wire to cut the tonsil.

Tonsillar Ulcer of Vincent.—L. T. Royster¹ observes that the term tonsillar ulcer as applied to this condition is not fairly descriptive of the affection, since the ulcer may occur in any part of the mouth, and suggests that a more correct description of the disease is that adopted by Mayer, who calls it an affection of the mouth and throat associated with a fusiform bacillus and spirillum of Vincent. He reports a case of a colored girl, 7 years of age, who had had previous good health, with the exception of whooping-cough at 3 years of age. When brought to the hospital she complained of a sore throat, which had been preceded 2 weeks before by an enlargement of the lymph-nodes of the neck; at the same time there developed a white patch on the right tonsil, which remained unchanged from the time it was first seen. Her pulse and temperature were normal, with no apparent indisposition except the pain on swallowing. The edges of the ulcer were red, and after removal of the slough, which was detached without resistance, there was left a bleeding base, the surrounding tonsillar tissue being indurated. Diphtheria was excluded, both from the fact of the disease having lasted 2 weeks with normal temperature and from negative bacteriologic examination. From a stained smear from the surface of the ulcer there were found the fusiform bacillus and the spirillum of Vincent. Following treatment by hot gargles of normal saline solution with local application of tincture of iodine the ulcer rapidly disappeared.

Tuberculosis of the Tonsils in Children.—L. Kingsford² states that tuberculosis of the tonsils in children instead of being, as was formerly supposed, a disease of great rarity, is one of comparative frequency; and while a considerable number of observers have recorded a large number of cases of tubercle of the tonsils in adults, so far as he can ascertain only 2—Friedmann, with the microscope, and Latham, by inoculation—have confined their attention to the tonsils of children. The usual method of infection of the tonsil is by tuberculous sputum or by the blood-stream, secondary to tubercle in the lungs or elsewhere, the former method being more common in adults, owing to the greater frequency of phthisical cavities, but in children the more usual infection is probably by the blood-stream. Primary infection of the tonsils is, however, not infrequently met in children, and in such cases the tonsils show either the only evidence of tubercle in the system or else lesions of an older date than any lesions elsewhere. He reports 17 cases, out of which 7 showed evidence of tuberculosis of the tonsils when examined microscopically, but only 3 exhibited any naked-eye evidence of the disease. Of these 3, one showed ulceration, another scarring, and the third a caseous spot. Out of 5

¹ Arch. of Ped., Aug., 1903.

² Lancet, Jan. 9, 1904.

cases where the tonsils were hypertrophied only 2 showed tubercle, the remaining tuberculous lesions being found in tonsils of normal size. The belief which has of late years steadily been gaining ground, namely, that the tonsils are one of the most important channels by which the tubercle bacilli enter the system in childhood, has many supporters, among them Woodhead, Latham, and Aufrecht. Aufrecht goes so far as to say that this happens practically in every case of tuberculosis at any age; he contends that the bacilli pass through the tonsil to the cervical glands, and from them directly into the blood-stream. It seems hardly likely, however, that they would frequently pass through the tonsils without leaving behind some lesion which, by its chronicity, age, or extent, would give some idea of its primary nature. In view of the small number of primary tonsil cases described compared with the total number of cases investigated he does not think we are justified in going further than to say that the tonsil is a recognized channel of infection and the evidence seems strongly against Aufrecht's contention. From his own cases and from the investigations of others he feels justified in drawing the following conclusions: (1) Tuberculosis of the tonsils, especially in cases with tubercle elsewhere is fairly common, though the disease is usually latent; (2) tonsil tuberculosis may be primary and, indeed, the only seat of the disease in the system, though this is rarely the case; (3) the usual method of infection is by the blood-stream in children from an older focus elsewhere; (4) infection also may occur by the sputum in children; (5) when the tonsils are tuberculous, the corresponding cervical glands become affected; (6) sometimes where it is probable that the infection entered through the tonsils, they were quite healthy, but the adjacent cervical glands were tuberculous.

Nocturnal Incontinence and Adenoids.—U. Melzi,¹ after observing 2 cases in his own practice in which nocturnal enuresis of years' standing was cured by the removal of adenoid vegetations, reviews the literature with reference to the relationship between the presence of adenoids and incontinence of urine. He concludes that whatever may be the pathogenesis of enuresis in children with hypertrophied adenoids, the fact remains that in a large proportion of cases extirpation of these vegetations does cure the condition; and in the treatment of enuresis the possibility of adenoids as an exciting cause should always be borne in mind.

Persistent Superficial Nasal Hyperemia in a Man Aged 21 Years Cured by Removal of Adenoids.—V. H. Wyatt Wingrave² (London) reports the case of a patient who complained of intense and persistent redness of his nose of 2 years' duration. The onset was gradual, and he could not associate it with any particular cause. He was a teetotaler, a very moderate smoker, and had excellent health. Nasal respiration was free, and nothing abnormal was to be seen by anterior rhinoscopy. The tip, the alae, and quite two-thirds of the nose were of an intensely vivid red color, somewhat shiny, but not swollen, tender, or painful. Being subject to indigestion, the patient was forbidden tea and was treated with alkaline tonics and saline aperients. After 2 months' treatment he

¹ Gazz. Osped., July 12, 1903.

² Lancet, Dec. 19, 1903.

showed no improvement, but a prominence of the supranasal vein being noticed, the nasopharynx was examined by the mirror and finger, revealing a large crop of adenoids. Their removal was soon followed by diminished redness of the nose, the prominent veins disappeared, and in one month the organ became normal in appearance and it remained so. The case is interesting in so far that it affords a striking illustration of the close relationship between the supranasal vein and adenoids during a period of life in which neither are commonly found and further increases the already

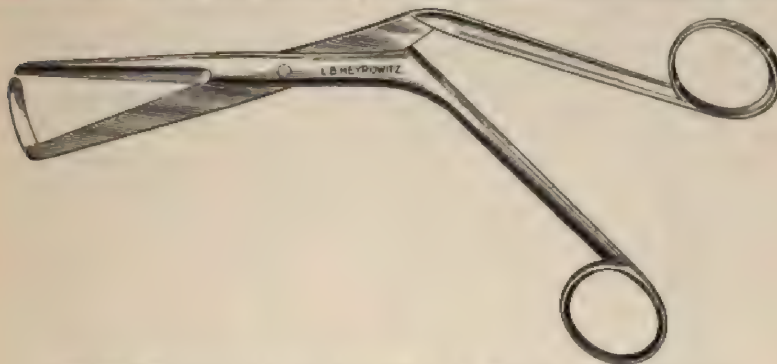


Fig. 68.—Stephenson's tonsil scissors (*Jour. Am. Med. Assoc.*, Sept. 19, 1903).



Fig. 69.—Stephenson's tonsil forceps (*Jour. Am. Med. Assoc.*, Sept. 19, 1903).

long list of troubles due to neglected adenoids. The subject is of further interest with regard to its pathology, which admits of several interpretations. First, there is the mechanic, in so far that the adenoids themselves directly interfere with venous return, thereby producing the prominent supranasal venous arch in infants, so often the subject of superstitious dread. Further, again, their interference with breathing leads to a general increase of venous pressure which the vessels in question specially show. A second view is that the adenoids are responsible indirectly by

causing a reflex inhibition of a local vasomotor influence. This may be the interpretation in the present instance, while the first view will be more applicable to children.

The Cure of Tic Douloureux.—De Champeaux¹ reports the case of a woman who had suffered for several years from facial neuralgia, and though she had been treated in many ways, each result was unsuccessful. At length it was found that she had hypertrophied adenoids, the removal of which cured the tic douloureux and following this also relief from an atrophic rhinitis with which she had long been affected.



Fig. 70.—Stephenson's tongue depressor (*Jour. Am. Med. Assoc.*, Sept. 19, 1903).

A New Tonsil Scissors, Forceps, and Tongue-depressor.—C. C. Stephenson² (Little Rock, Ark.) describes and gives illustrations of 3 new instruments (Figs. 68-70) as follows: The forceps are made to seize the tonsil, when the handles are locked with fixation ratchet; the tonsil is then drawn out, the beak of scissors is passed behind, and the gland completely removed, as with an ordinary scissors. The object of the beak is to prevent the tonsil slipping from between the blades of the scissors. The handle of the tongue-depressor is octagonal in shape and curves outward, thus allowing an examination of the full-chested class of patients without the end of the handle coming in contact with the chest. The blade has 3 holes to prevent the tongue from slipping. [The fixation ratchet, which seems to be the only point of difference between this tenaculum and those generally employed, we have found a disadvantage rather than a point in its favor; since the instrument must be held by thumb and finger in any case, the fixation ratchet renders it unnecessarily difficult to release in case of an emergency. The holes in the tongue-depressor are advantageous, though we fail to see the necessity of the curved handle unless it is made with an extremely long shaft, which would be of no advantage.]

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DISEASES OF THE LARYNX AND TRACHEA.

Operative Treatment of Malignant Disease of the Larynx.—Sir Felix Semon³ (London), in an address before the British Medical Association, reviews the subject thoroughly both from past and from present opinions held, directing his chief attention to thyrotomy as the ideal method of treatment to be employed for carcinoma of the larynx. In 1887 Paul Bruns asserted that to attempt to extirpate the disease by means of thyrotomy has been shown to be altogether insufficient

¹ *Arch. Int. de Laryngol.*, Aug., 1903. ² *Jour. Am. Med. Assoc.*, Sept. 19, 1903.

³ *Jour. Lar., Rhin., and Otol.*, Sept., 1903.

and useless, which conclusion was based upon the history of 19 cases treated by that method. Two of the patients died shortly after the operation; in 16 recurrence and death sooner or later took place; while in the remaining one death occurred 22 months after the primary operation, from cancer of the suprarenal glands, though the larynx remained unaffected until the end. Semon, however, seems to have obtained very different results. His plan is to divide the cartilage into 2 lateral halves, dissect out freely all the soft parts around the newgrowth, using care to remove the entire mass, even though it may involve one or both vocal cords. After removal of the malignant growth the larger upper part of the wound is closed, the lower part being left open for 2 or 3 days until all danger of septic complication is passed. In a summary of 18 cases operated upon between June 2, 1901, and July 29, 1902, and not reported until one year later, 15, or 85 %, are now alive and well; and the vocal results, with the exception of a few cases in which it was necessary to remove both vocal cords, are surprisingly good. The following rules are emphasized: (1) The operation must be restricted to early stages of intrinsic malignant disease; hence an early diagnosis is indispensable. (2) The operation must be thorough, a point which he forcibly emphasizes, since its violation in one single part of the periphery of the newgrowth may destroy the entire purpose of the operation. (3) Should it be found, after opening the larynx, that the disease is more advanced than it appeared from laryngoscopic examination, it is the duty of the operator not to limit his interference to the operation originally contemplated, but to perform partial laryngectomy or any other operation necessary, when the extent and depth of the newgrowth have been definitely ascertained.

Gluck (Berlin) followed Semon in an exhaustive report upon the results of his own method of treating malignant disease of the larynx. His method was the outgrowth of the necessity of finding a satisfactory method of treating cases in which thyrotomy had from the first been unsuited or in which this method was no longer available. In the majority of such cases he had found total excision of the larynx to be the essential feature of treatment, following which course his operations had been attended with most brilliant results. Out of 27 cases in which he performed this formidable operation, 26 recovered. To avoid what is termed "swallowing pneumonia,"—one of the main elements of immediate danger in laryngectomy,—he in every case completely detached the trachea from the larynx, and sutured it to the skin of the neck, thus securing external respiration, and at the same time preventing the possibility of fluids passing from the throat into the lower air-passages.

Cicatricial Deformities in the Respiratory Tract Due to Causes Other than Syphilis and Traumatism.—G. Hudson Makuen¹ (Philadelphia) observes that the comparative rarity of cicatricial deformities due to causes other than syphilis and traumatism, suggested by a case in point, led him to make some investigations as to their frequency, the result of which is here given. In answer to about 300 letters to laryn-

¹ Laryngoscope, Oct., 1903.

gologists in the United States and Canada, the question asked being, "How many cases have you seen of acquired cicatricial deformities in the respiratory tract due to causes other than syphilis and traumatism, and exclusive of tonsillar adhesions? Give number in—(1) the nostrils; (2) the pharynx; (3) the larynx, and (4) the trachea"—there were received many interesting and instructive reports, some of them giving details of special cases, from which the following statistics are made: In the nostrils diphtheria claims 27 cases; scarlatina, 14; membranous rhinitis, 10; catarrhal erosion, 9; tuberculosis, 3; smallpox, 3; septal abscess, 2; measles and typhoid fever, each, 2; lupus, erysipelas, and pemphigus, each, 1; and no cause could be determined in 271 cases. In the pharynx diphtheria claims 41 cases; scarlatina, 21; diphtheria and scarlatina combined, 6; lupus, 10; tuberculosis, 3; and no cause discovered in 6. In the larynx typhoid fever claims 4 cases; diphtheria, 3; lupus, 2; scarlatina, measles, and tuberculosis, each, 1; and no cause was discovered in 2. In the trachea influenza was the cause of 1 case. Total: In the nostrils there were 347 cases; pharynx, 87; larynx, 14, and trachea, 1. Thus we find that 300 observers have seen 449 cases of cicatricial deformities in the respiratory tract that appear not to be due to syphilis or traumatism; the greatest number—16 %—of these were caused by diphtheria, and the next greatest, or 8 %, by scarlatina.

Treatment of Laryngeal Tuberculosis.—L. Grünwald¹ recommends the employment of galvanopuncture in the following manner: After thorough anesthetization of the larynx a very fine platinum cautery point is applied to the area of infiltration, and when it becomes incandescent, it is gently pushed down into the tissue. When the infiltrated area rests on healthy tissue, the latter affords a feeling of resistance to the further progress of the cautery point, which must not be pushed any further. If the infiltration lies free and unsupported, the penetration of the needle is indicated by a red glow in the trachea, and as soon as the point can be freely moved about in the tissue, it may be withdrawn. The procedure usually lasts from 5 to 10 seconds. The reaction is remarkably slight; in a few cases a small degree of swelling was observed in the surrounding parts, but pain was rarely present. In a few severe cases some dysphagia was noticed, and in others in which a previous dysphagia had been present, it immediately disappeared. Grünwald also remarks that this procedure is not necessarily limited to tuberculous infiltrates, but can be employed successfully in an advanced inflammatory hyperplasia.

An Unusual Cause of Laryngeal Obstruction.—Fred J. T. Sawkins² (Sydney) reports the case of a Syrian child, 20 months old, whom he found in a condition of advanced dyspnea from laryngeal obstruction. The fauces were congested, tonsils large, and though there was no membrane to be seen, the child was sent to and admitted in the diphtheria hospital. With steam-inhalations the dyspnea decreased and tracheotomy was dispensed with. No bacillus of diphtheria could be found, so he was dis-

¹ Münch. med. Woch., June 23, 1903.

² Australasian Med. Gaz., Mar. 21, 1904.

charged in a week's time relieved, but still with considerable difficulty in breathing. A few days later he was again seen in much the same condition as on the first occasion. He was then admitted to the Lewisham Hospital, where the trachea was opened the same day, the tonsils and adenoids being removed at the same time. He wore this tube for 2 months, any attempt to dispense with it causing alarming attacks of dyspnea. Under anesthesia his larynx was repeatedly examined, but very little information was gained except that the epiglottis was apparently abnormally curled on itself and overhanging and obscuring the rima. On the last occasion, however, just as Sawkins was withdrawing the mirror, a deep inspiratory effort was made by the child and a glimpse of a rounded body slipping into the interval between the epiglottis and larynx was observed. Further observation showed that this was repeated at each inspiration, and on lateralizing the mirror the body was seen to be the tip of the uvula. This formed a complete plug and fully accounted for the inspiratory obstruction. The mirror had on previous occasions lifted the uvula so that the phenomenon could not occur. The uvula was removed, and within 48 hours the tracheal tube was left out, nor was it ever necessary to reinsert it. The child now breathes quite naturally and without difficulty.

Efficiency of Local Treatment as a Factor in the Cure of Laryngeal Tuberculosis.—Ross Hall Skillern¹ (Philadelphia), in a review of the general local treatment of tuberculous laryngitis advocated during the past 15 years, gives the following, with the dates at which they first were employed: Before the year 1890 a number of drugs, which have been entirely discarded, such as tannin, ethyl iodid, chromic acid, ergot, the salts of zinc and copper, etc., were used, also a number of drugs that are now considered almost indispensable, such as lactic acid, guaiacol, menthol, carbolic acid, iodoform, and a host of others. Counterirritation to the front of the neck, external applications of croton oil, antimonial ointment, fly-blisters, steam-inhalations, sulfurous waters, etc., were also used. In 1890 a decided departure from the routine treatment was made when Moritz Schmidt used tuberculin hypodermatically. He reported 21 cases in which the patients were all greatly relieved, but adds that one must be ready to perform tracheotomy on account of its giving rise to sudden swelling and asphyxia. This opinion was also shared by Lennox Browne, but later investigations proved that it gave no better results and was far more dangerous than the ordinary local treatment. In 1891 Koch's tuberculin was introduced and was at first highly praised, especially by Lennox Browne, in his monograph, "Koch's Remedy in Relation Specially to Throat Consumption," but later it proved of less value than the antituberculous serum of Paquin. About this time the first reference to anilin products was made when Bogroff recommended fuchsin, which has since fallen into disuse. Krause modified the lactic-acid treatment of Heryng by first cureting, then applying the acid. Skillern believes this method, if the curet is used gently, one of the best in use at the present day in certain cases. In 1892-93 intralaryngeal in-

¹ Amer. Med., May 7, 1904.

jections of a mixture of guaiacol and menthol were popular. Resorcin in 80 % to 120 % solution was used with some success for ulcers. In 1894 Heryng, the originator of the lactic-acid treatment, stated that it was useless in cases where there was hard infiltration without ulceration. Hunter's modification B of tuberculin was tried in increasing doses from 0.0025 gm. to 0.1 gm. The reaction was slight and improvement noted, but no cures reported. In 1895, at the International Congress of Physicians at London, Gougenheim strongly urged energetic surgical interference. In 1896 Gleitzman contended that the curet and even the punch forceps should be used in all cases of, first, primary laryngeal tuberculosis; second, circumscribed infiltrations and ulcerations; third, dense hard infiltrations and ulcerations of the arytenoid region, the posterior wall of the larynx, the ventricular bands and tumors of the epiglottis; fourth, in advanced cases to relieve the dysphagia. Counter-indicated in, first, advanced pulmonary disease and hectic type; second, disseminated disease of the larynx; third, extensive infiltration producing severe stenosis. In 1897 powders, such as iodoform, aristol, iodol, etc., were used extensively, and Allan introduced the menthol, camphor, and albolene mixture. S. Solis Cohen recommended formaldehyd in solution. Murray used enzymol with some success in cleaning off ulcers; this being a proteolytic digestive ferment, it merely digested the dead tissues on the surface of the ulcer, which, when removed, left a clean surface. In 1898 Chappell reported good results with hypodermatic injections of anti-tubercle horse-serum prepared at the laboratory at Washington. In 1899 Yonge reported the use of orthoform insufflated into the larynx, which had the advantage over iodoform in that it acted as a decided local anesthetic and had strong antiseptic qualities. In granular conditions of the vocal cords he found intertracheal injections most efficacious. Gallagher advocated formaldehyd in increasing solutions from 1 % in cases in which the disease had not advanced too far. In advanced cases one drop to the ounce of water, used in the form of a spray, acted as an anesthetic. In 1900 Schmithuisen reported that he had used the galvanocautery since 1890, and considered it the best form of treatment. Scheppegeirell advocated cupric electrolysis. In 1901 Stanislaus von Stein urged the employment of a solution made up of carbolic acid, 9 parts; salicylic acid, 1 part; lactic acid, 2 parts; menthol, $\frac{1}{10}$ part. After its application dysphagia improved, dry ulcers became clean, and the larynx resumed a rosy-red color, and in cases in which there was ulceration with infiltration, improvement was very rapid. Freudenthal considered the treatment by lactic acid antiquated and barbarous, and urged the use of an emulsion of menthol and orthoform with heroin for the cough. Donellan advised the interlaryngeal injection of sodium cinnamate in 1 % to 5 % solution every 3 or 4 days. In 1902 Freutag and Neuman advanced an entirely new treatment, which consisted in absolutely refraining from using the voice and no local medication. Grayson recommended intertracheal injections of a solution of menthol, guaiacol, and eucalyptol in olive oil to relieve the cough. Off and Newcomet experimented extensively with the röntgen rays, with disappointing

results. In 1903 Marmorek's serum (which the Italians claim to be identical in every respect with Maragliano's) was introduced. While it is too early to pass judgment on it, still it appears to be looked on with disfavor. It is a well-established fact that all patients improve temporarily under a new treatment, and this fact has been the cause of many authorities advancing treatments and promising the most brilliant results, which ultimately are found to be of no more value than those formerly employed. In conclusion he makes the following summary:

1. Local treatment is always beneficial, even if it relieves only the most distressing symptom—that is, pain.
2. It depends entirely upon the general condition of the patient what form of local treatment is most advisable.
3. While laryngeal tuberculosis in some cases may be entirely cured, there always remains more or less chronic laryngeal catarrh.
4. Extensive surgical procedures in cases in which the lungs are deeply involved, except as a palliative treatment, are unjustifiable.
5. Extensive curetment should be employed only in those cases in which there is a fair chance of curing the disease, and when it is necessary to prolong life a short time.
6. The prognosis depends more on the general systemic condition of the patient than upon the throat lesion. It naturally follows that the more severe the throat lesion, the greater the degree of constitutional weakness.
7. If a case is seen at an early stage of its development, the prognosis is good, provided, of course, the concomitant lung disease is responding to treatment.
8. When there is much ulceration and loss of tissue, absolute cure is impossible, but such an amelioration of symptoms may be brought about as to render the patient fairly comfortable for the remainder of his existence.
9. The best results are obtained when the tuberculous deposit in the larynx is localized.

Congenital Laryngeal Stridor.—James E. Newcomb (New York) states that during the last few years he has seen 3 cases diagnosed as the so-called congenital laryngeal stridor, and though the circumstances in each case have been such that it could not be followed and its later history obtained, he has been deeply interested in the study of the subject, and has deemed it one not unworthy of attention. The literature, somewhat scant, is reviewed in his article, which is supplemented by personal observations. By the clinical term describing the condition is meant a stridor coming on within a few days of birth, continuing for a certain period, measured usually in months, but possibly in years, apparently not doing the child much if any injury, and finally subsiding of its own accord, without sequelae. As frequently happens in the case of rare diseases, some of the writers have endeavored to establish, from a very limited experience, a variety of etiologies, and in the light of our present knowledge have no longer drawn the lines of their individual picture. The malady seems to predominate in male children, though the reason is assigned therefore. It is to be recognized, characterized and made applicable, it has received a classification of the infantile larynx, epiglottitis, and aryepiglottic cysts. The appearance and incidence of laryngeal curvature, being found in about 20 per cent of the cases, is of importance.

Mar. 7th 1874

arched or curved roof; or the aryepiglottic folds have been devoid of their usual firmness, and their free ends, being thin and flabby, have nearly touched. He states that in view of the scattered reports of the cases and the fact that no one writer has seen very many of them, it is not surprising to find a wide diversity of theories as to the underlying cause of the condition. Thus he considers the various hypotheses submitted, among which are the following: (1) Thymus enlargement causing pressure. (2) Cicatricial band across the larynx. (3) Acquired brain-lesion causing anatomic deformity. (4) Lack of development of the cortical centers of respiration, especially of the laryngeal centers. (5) Posticus paralysis. (6) Muscular spasm, either glottic or subglottic, and possibly phrenic. (7) Adenoids. (8) Congenital deformity of the superior laryngeal aperture, aided by the flaccidity of the parts in infancy, but not entirely dependent thereon. This latter cause is the theory advanced by Lac, and Newcomb states is the one which has met with the most general acceptance. The upper laryngeal aperture acts as a valve; its lateral walls fall in during inspiration; as the patient grows and the parts become firmer, this lateral prolapse gradually ceases. In this theory Thompson and Logan Turner agree, and they have reproduced the stridor in the cadaveric larynx of children by imitating forcible inspiration through the glottis. Thompson believes that in life the laryngeal deformity arises from disturbance of respiratory coördination resulting in a constant sucking-in of the upper margins of the infantile larynx, "a process strictly analogous to the formation of pigeon-breast." In making a diagnosis the condition must be differentiated from—(1) Papilloma; (2) catarrhal laryngitis; (3) essential spasm of infants; (4) phrenoglottic spasm; (5) congenital retraction of larynx; (6) paralysis of dilators; (7) hereditary syphilis; (8) retropharyngeal abscess; (9) adenoids; (10) laryngeal stridulus. Stridor comes on soon after birth; it is slight, and there is no cyanosis; crying usually stops it; deglutition has no effect upon it; sleep never aggravates it and it may stop it; in other words, we have to do with a condition in which there is a temporary anatomic deformity and an alteration of the relations between the muscles of the throat and those of the larynx. There may be the added factor of a central nerve disturbance. Under treatment he states that Robertson orders ammonium bromid, alkaline sprays, and resorcin in mineral oil. He also advises the clearing-out of the pharynx and nasopharynx before secondary contracture sets in. Such a therapy is based, of course, on his theory of etiology, namely, posticus paralysis. Variot has suggested partial resection of the aryepiglottic folds if dyspnea should ensue and threaten life. Merklen and Devaux summarize treatment as bromids, strychnin, warm baths, eucalyptus inhalations, and antiseptics of the upper air-tracts. On the basis of the theory which we have accepted in this paper a general tonic régime is all that is called for.

Surgical Treatment of Cancer of the Larynx.—E. J. Moure¹ (Bordeaux) observes that it is beyond dispute that extralaryngeal malignant tumors—that is, tumors involving the epiglottic region—

¹ Brit. Med. Jour., Oct. 31, 1903.

he approves of the method as outlined by Sir Felix Semon. He describes fully the method of this major operation, and states further that when the tumor extends beyond the limits just described, it may be necessary to interfere more extensively. Thus, if during the performance of thyrotomy one finds malignant degeneration of part of the thyroid cartilage,—one of its alas, for instance,—one ought to excise the affected region freely, or, if necessary, even remove half the larynx. After all, however, his concluding sentence bears the mark of a conservative retrospect when he states that, unfortunately, even in favorable cases, when the tumor does not recur after laryngectomy, the patient finds himself in such a condition of inferiority to his fellows that he may with some reason ask himself, at least in certain cases, whether death would not have been preferable to such an existence as is left to him.

A Tuberculous Laryngeal Stenosis Treated by Tracheotomy.—

J. Price-Brown¹ (Toronto) reports the following case because of its unusual history and the remarkable condition of the patient at the present time. The patient, a piano-builder, aged 30, was first seen on April 2, 1901, having been under treatment for 2 or 3 years by another physician for dry cough; for several months his throat had been sore, resulting in odynophagia and dysphagia. On examination the larynx was found infiltrated, particularly the left side of the epiglottis, rendering examination of the vocal cords difficult. There were ulceration along the margin of the vocal cord and slight abrasion of the left arytenoid and the aryepiglottic fold, the whole larynx being bathed in mucus. Since the larynx presented the most prominent symptoms, the treatment was mainly directed toward the relief of that organ, consisting of the daily use of an alkaline spray, followed by one of menthol in alcohol (5 %), and also every third or fourth day the application of a 50 % solution of lactic acid. Following laryngeal treatment in the office the patient took inhalations, first, of hot air, second, of mentholated air. Internally, compound syrup of hypophosphites was given; also during the summer cod-liver oil, iron, and creasote. After about a month's time swallowing became easier, the infiltration had somewhat abated, the larynx was cleaner, and the ulceration on the cords looked healthier, although the voice was still aphonic. During the following year the patient continued to improve, gaining in weight, though tubercle bacilli were found in his sputum. A few months after this, however, the patient had a relapse, the infiltration in the larynx increasing, and the stenosis becoming so severe that relief from impending suffocation was urgently required. Thus on November 10, 1902, tracheotomy was performed, following which the laryngeal symptoms slowly improved. Other treatment was practically *nil*, the objects being to give the larynx perfect rest and to build up the system by an abundance of nutrient food. His room was well ventilated and there was evaporation of moisture from a pan of hot water. The only throat treatment was an occasional spray of 5 % menthol in alcohol. For some time he continued to run down in flesh, and

¹ Canadian Jour. of M. and S., Aug., 1903.

it was not until he became thoroughly adjusted to the new condition of things that this ceased. He then weighed 125 pounds. From that time onward, although it was winter, he went regularly out-of-doors; fever abated and practically disappeared; expectoration through the tube and throat became less, and he steadily gained in weight. Present condition: He still wears the tube. If taken out, the stenosis is too great to permit of reasonable respiration. When he closes the tracheal opening with his finger he can speak in an intelligible guttural tone. He sleeps and eats well, and has no difficulty in swallowing. His weight is 140 pounds, as heavy as he ever was in his life. No tubercle bacilli can be found. The patient manages the tube himself without any difficulty, and takes one or both out for cleaning purposes whenever required. Three points worthy of notice in the treatment of this case are as follows: 1. The facility with which oleaginous sprays enter the larynx. When treating the patient at his office, the physician frequently took out the entire tube, cleaned and dried the opening into the trachea, then, with compressed air and the down tip, sprayed the larynx with mentholated albolene, instructing him to inhale at the time. While in the act of spraying the oil would trickle out of the opening and down the neck; this invariably would be the case if the spray was at all profuse. 2. Although we all admit that the moisture of the nose is requisite to prepare the air for respiration, this man, suffering from combined pulmonary and laryngeal tuberculosis, has for nearly 6 months breathed practically dry air into his trachea, not only with impunity, but with actual benefit to his tubercular condition. Not only that, but although the tube has been taken out dozens of times and examined carefully, the trachea or even the passage to it has never been found in a dry or irritable condition. 3. While in a case like this Price-Brown believes tracheotomy is the best and perhaps the only means of affording relief, yet in the majority of cases of laryngeal tuberculosis it would be too hazardous to be worthy of trial. When cough does occur, it is very convulsive, ineffectual, and distressing to the patient, which in severe pulmonary disease attended by copious discharges would be only aggravated by the presence of a tracheal tube, and in such instances tracheotomy would be worse than useless.

MISCELLANEOUS.

The Immediate Relief of Hysteric Manifestations of the Larynx.

—Hanau W. Loeb¹ (St. Louis) reports with remarkably successful results his method of dealing with hysteric aphonia, hysteric mutism, and hysteric cry, with report of cases covering each class. He states that while it is clear that the method is simple, painless, easy of application, and successful, he makes no claim other than that the relief from the laryngeal symptoms is obtained and not that symptomatic relief is tantamount to a cure. All plans of treatment have as their

¹ Jour. Am. Med. Assoc., Jan. 16, 1904.

basis the deception of the patient or the direction of the patient's mind away from false conceptions toward possibilities that are within his reach, if only he will utilize them; in other words, suggestion in one form or another is used. This may be extended over a period of time, or it may be so decided that it is effective at the first sitting. To the former class belong such plans of treatment as manipulations of various kinds and operations distant from the seat of the symptoms. Immediate suggestion, on the other hand, is mainly used through the medium of a strong electric current which is sent through the larynx and generally becomes effective at once. He first impresses the patient not only with the gravity of the affection, but with the certainty with which relief can be given. He is told that relief will follow an operation of some severity; which suggestion is made at the first sitting or at a subsequent one, as seems most desirable, owing to the patient's general physical condition. The patient is told that the word "home" is the easiest word to pronounce, and that keeping this word in mind he will be able to speak it immediately after the operation. The patient is then placed in a chair, and the index-finger of the right hand of the operator is introduced into the pharynx, the epiglottis being pressed down until the patient becomes somewhat uncomfortable. On withdrawing the finger he is commanded in a loud voice to say "home, home, home." The patient responds, and the command is continued as often as is necessary until not only this word but many others are repeated. It is frequently possible to have, after a single treatment, complete return of the voice.

Laryngeal Complications in Typhoid Fever—Tracheotomy; Recovery.—Homer Dupuy¹ (New Orleans), in reporting a case of submucous laryngitis complicating typhoid fever, reviews at some length 25 other reported cases and emphasizes the point that laryngeal complications occur more frequently than is generally supposed, and when present, diminish the chances of recovery. The following general conclusions are noted: These 25 collated cases reported in the last 58 years, which for evident reasons are only approximately correct, afford eloquent proof that the subject of typhoid affections in the larynx calls for general recognition. Evidence, bacteriologic and clinical, strongly supports the view, adopted by the majority of observers, that the laryngeal involvement in most instances is a direct typhoid infection. A high death-rate, as shown by statistics, when this complication exists, teaches the salutary lesson of always examining the larynx when the danger-signals of hoarseness, dyspnea, or dysphagia set in. The favorable results which follow operative interference offer such a contrast to the high mortality without operation that there can be but unanimity of opinion as to its propriety. Tracheotomy is the most approved because in most cases the only possible surgical procedure which can save life. He gives a synopsis of 25 cases in which complete reports or abstracts were accessible.

¹ N. Y. Med. Jour., Dec. 26, 1903.

LESIONS IN LARYNX.

| | Cases. |
|--------------------------------|----------|
| Laryngeal perichondritis..... | 5 |
| " ulceration..... | 5 |
| " necrosis..... | 3 |
| " abductor paralysis..... | 2 |
| " edema..... | 3 |
| " diphtheria (presumably)..... | 3 |
| Ludwig's angina..... | 2 |
| Abscess in larynx..... | 2 |
| | <hr/> 25 |

FINAL RESULTS.

| WITH OPERATION. | | | | | | WITHOUT OPERATION. | | |
|-----------------|-------------|--|--|---|---------------------------|--------------------|-------|------------|
| Tracheotomy. | Intubation. | Recovery: (Tracheotomy, 6) (Intubation, 1) | Died: (Tracheotomy, 4) (Intubation, 1) | Complete recovery without chronic laryngeal stenosis. | Wore cannula permanently. | Not operated on. | Died. | Recovered. |
| 10 | 2 | 7 | 5 | 4 | 3 | 13 | 9 | 4 |

Illustrations of the Effects Produced by the Singing Voice in a Suitable Medium.—Arthur George Haydon¹ (London) presented to the British Medical Association a subject which, while entirely new, was interesting both from a physiologic and from a pathologic standpoint, and may prove to be of some value as a means of diagnosis. It has recently been discovered that the vibration of the singing voice in

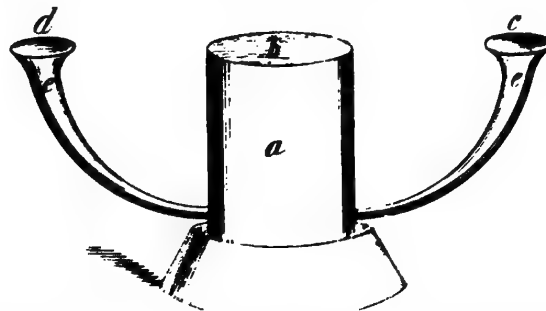


Fig. 71.—The idiophone: a, Cylinder; b, membrane; c, inlet, mouthpiece for singer; d, outlet; e, a, tubes (Haydon, in Brit. Med. Jour., Oct. 31, 1903).

health, when tested by a certain apparatus known as the idiophone (Fig. 71), will produce the formation of pictures of flowers in various colors. This instrument is thus described: A porcelain cylinder is used, measuring 6 inches in length, with a diameter of 5 inches, closed at one end by the same material and open at the other. In the wall of the cylinder 2 holes are made on opposite sides and into each hole a long tube is inserted provided with a mouth piece like a speaking tube.

¹ Brit. Med. Jour. Oct. 31, 1903.

Over the open end of the cylinder a membrane of great delicacy is placed, and this is covered by lycopodium dust, the under surface of the membrane having been previously coated with a layer of gelatin; and on this various points of the primary and secondary colors are dusted in the form of fine powder. In order to produce the results mentioned above the vocalist should sing into one of these tubes, the other being left open; the voice is therefore bottled up for a time in the cylinder, and the vibrations, during its transit, have been found to cause the various colors to pass through the gelatin and coalesce, to form the most extraordinary and beautiful pictures of flowers; these can be seen on the exposed surface of the membrane. The pictures vary in character according to the timber of the voice, the time of the music, whether it be *adagio*, *andante*, *allegretto*, or *presto*; and also if the music is joined as in *legato* passages, or separated as in *staccato* movement. The results of these experiments have been photographed, those shown in the original article being selected from a large number as good examples of the simple and complex forms respectively. As to the medical application of this invention, its value will depend upon its capability of producing similar pictures from the voices of similar diseased conditions, whether they are from abnormalities of the lungs, bronchi, trachea, larynx, pharynx, or palate.

A Collar-button Removed from the Lower Lobe of the Left Lung Through the Natural Passage.—G. Killian¹ (Freiburg) reports the case of a man of 40, who had swallowed a collar-button, which, although passing into the bronchus, caused only slight symptoms. Physical examination pointed to the right lung as the place where the collar-button had lodged. Direct bronchoscopy failed to find it, although the entire right bronchus was searched. A search of the left bronchus showed it to be far down in the main bronchus of the lower lobe, 5 cm. (2 in.) below the end of the tube, therefore 32 cm. (13 in.) from the teeth. He succeeded in grasping it by means of a Lister hook, and removed it at the first attempt. Further study brought to light an incipient pulmonary tuberculosis of the right side.

Preliminary Note on the Treatment of Lupus of the Upper Respiratory Tract by Radium.—Delsaux² has devised a small bulb, hermetically sealed, containing 20 milligrams of radium bromid, which is fastened to a metal collar. This, screwed to the extremity of a straight or curved stem with a handle, forms an instrument for introduction into the nose and throat. With this device he makes applications of one minute each, gradually increasing to 5. The first effect observed was anemia of the diseased surface adjacent to the bulb, the patient feeling a slight sensation of constriction. Following the sixth application edema of the glottis was observed, which subsided under simple treatment, while simultaneously the other affected parts showed marked reaction. Consequently the daily applications were limited to 45 seconds; after 19 séances had been made Delsaux considered the beneficial results

¹ Wien. klin. Woch., 1903, xvi, 305.

² La Presse Oto-Laryngol. Belge, Aug., 1903.

to be greater than from the application of any other agent which has been used.

Diagnosis and Treatment of Diseases of the Throat in Children.

—N. Filatov¹ (Moscow), in a very comprehensive review, sets forth the usual varieties, with the addition of a few not familiarly found in American classifications of diseases observed in the throats of children. He makes the point that while acute inflammations of the mucous membrane of the fauces often occur in children, yet since children younger than 5 years usually do not complain of painful deglutition, these phenomena may be easily overlooked unless the physician adopts the rule to examine the throat in every diseased child, particularly in febrile conditions. The strict fulfilment of this rule is the chief condition to insure a correct diagnosis of throat diseases in children. In many cases, especially in nurslings, inspection alone is insufficient; one must also feel the throat with the finger, by which an otherwise overlooked retropharyngeal abscess may be discovered. Various classifications and subclassifications are made, the main divisions employed being: (1) Diseases of the throat characterized by reddening of the mucous membrane of the tonsils and soft palate, under which he includes simple or catarrhal sore throat (*angina catarrhalis*), genuine catarrhal sore throat (*angina catarrhalis rheumatica*); (2) disease of the throat manifested by formation on the tonsils of whitish-yellow islets, under which he groups follicular sore throat (*angina follicularis*), lacunar sore throat (*angina lacunaris*), aphthous sore throat, punctate diphtheria; (3) diseases of the throat accompanied by the formation of coats or membranes, including herpetic sore throat (*herpes tonsillarum sive angina herpetica*), membranous or pseudodiphtheric sore throat (*pseudodiphtheritis*, *s. angina diphtheroidea*, *s. angina fibrinosa simplex*), true diphtheria. The title of this paper is somewhat misleading, from the fact that it is devoted largely to the differential diagnosis rather than to treatment of the various conditions. Under *angina follicularis* he states that this form differs from all other spotted sore throats by the equable size and regular shape of the islets, the eruption of which never extends over the margins of the tonsils. This disease starts from the very first with high fever, occasionally with vomiting, and may, therefore, raise suspicion of fever, the more since the scarlatinal sore throat sometimes develops in the form of a follicular one; such doubt, however, could not last longer than 24 hours, *i. e.*, until the appearance of the scarlatinal rash. The *angina lacunaris* differs from the preceding form by the shape and color of the islets. On the reddened tonsil there are noticeable irregular figures of an entirely white color. There is no elevation of mucous membrane, but simply an accumulation of catarrhal secretion in the hollows which are so abundant in the tonsils, especially if they are hypertrophied. If the plugs of the lacunas are of a pearly white color, then is the diagnosis easy, because in other punctate sore throats the islets are of a yellowish or grayish tint; if, however, the lacunas are filled out with mucopurulent secretion, then the disease may be thought

¹Translated from the Russian by G. B. Hassin (Chicago), Clin. Rev., Jan., 1904.

of as a spotted diphtheria. The first peculiarity of diphtheria is that the exudation (wherever diphtheria may be—in the throat, intestines, etc., it is immaterial) occupies first the eminent parts of the mucous membrane, and therefore the diphtheric process will affect first not the cavity of the tonsillar hollow, as it occurs in lacunar sore throat, but the edges. In such a case one must postpone the final decision until the next day, and take advantage of the other peculiarity of diphtheria, namely, its liability to spread over the surface. Lacunar sore throat begins and runs with high fever and has a cyclic course, ending with crisis on the third, seldom on the fourth, day. If, however, diphtheria starts with high fever, it always has, during the first days, a progressive course, assumes a membranous form, and never terminates so quickly without the serum treatment. Aphthous sore throat is characterized by formation, on the mucous membrane of the soft palate and tonsils, of small, round, superficial, yellowish ulcerations the size of a pea with decidedly hyperemic edges. It is not easy to confound this morbid form with diphtheria or other punctate sore throats, because ulcers are never confined to the tonsils only, but are always accompanied by aphthas in other parts of the oral mucous membrane, especially on the tongue, lips, and gums. Under the last division he calls attention to the fact that in a normal, nonhypertrophied tonsil there may always be seen in its center a large hollow (lacuna) of an oval shape, with its longest diameter from above downward. This hollow is sometimes filled in catarrhal or parenchymatous sore throat with a mucus plug up to the top (as in lacunar angina the small hollows are filled), and then a white spot appears in the center of the swollen and reddened tonsil, adherent so firmly that it cannot be removed with a brush, simulating, therefore, diphtheric sore throat. This variety of lacunar sore throat is often accompanied by a considerable swelling of the whole gland,—angina parenchymatosa,—and often terminates in the formation of an abscess. The beginning of the disease is manifested by violent fever, usually associated with chills, and in older children by difficult deglutition. The white spot developing on the place of a lacuna has the following peculiarities, by which it can be differentiated from a diphtheric coating: (1) It always occupies the middle of the tonsil; (2) it always has an oval form, with the longest diameter from above downward; (3) its edges are sharply limited; the surface, however, reaching the mucous membrane, is seldom elevated; (4) its color is at the start intensely white; (5) the size of the spots remains stationary during several days. Herpetic sore throat is characterized by the appearance, on the tonsil, of a group of thickly crowded vesicles, which very soon rupture and leave in their place an erosion, surrounded by a bright-red ground. This erosion soon becomes covered with a fibrinous membrane which simulates diphtheria. The eruption of the small vesicles and the formation of the yellowish coating are preceded by a febrile condition of 2 or 3 days' duration, sometimes very severe. The disease terminates in recovery in 3 or 4 days. If the physician did not see the vesicular period, he may easily fall into a mistake by accepting the

grayish-yellow surface of the erosion for the diphtheric coat, which it resembles in color and outline. According to Cadet de Gassicourt, herpes of the pharynx is the most frequent source of error, not always avoidable by a single examination; but one can hardly agree that angina herpetica appears as a frequent cause of doubt, since this form of malady occurs but seldom. Under pseudodiphtheric sore throat he states that the name is employed in a purely clinical sense, and includes every kind of inflammation of the mucous membrane occurring with the formation of white or whitish-yellow coats similar to diphtheric, but independent of the diphtheric poison—i. e., sore throats in which Löffler's bacillus cannot be found either by microscopic examination of the membranes or by making cultures on blood-serum. That diphtheric coatings may be produced not only by Löffler's bacillus, but also by other microorganisms, is now undoubted, but which microbes possess this peculiarity we do not positively know; it is certain only that different microorganisms—for instance, streptococci, Brissou's small coccus, staphylococci, Fränkel's pneumobacillus, etc.—can produce such membranes. On the basis of personal observations made during late years on the clinical material of the hospitals for contagious diseases (Moscow) the conclusion was reached that the staphylococcus and streptococcus are the most frequent elements in the pseudomembranous sore throat, and that, for instance, almost all cases of scarlatinal diphtheria may be called streptococcus from a bacteriologic point of view. It is also undoubtedly true that streptococcus pseudodiphtheric sore throat is sometimes observed without scarlet fever, viz., as a genuine independent disease. In such cases one cannot deny the possibility of scarlet fever without eruption; but such a proposition may sometimes be denied positively by the fact that the patient immediately after streptococcus pseudodiphtheric sore throat becomes infected with scarlet fever. Filatov having had a similar case in 1892. Klebs observed a whole family epidemic of false diphtheria which was caused by a large micrococcus of the group of monads, from which he drew the conclusion that the contagiousness is not to be held as a proof that a given sore throat is not of pseudodiphtheric nature. In point of differentiation from true diphtheria he states that one may with greater or less reliability exclude the pseudo-variety if the membranes spread over the edges of the tonsils on the soft palate, uvula, nose, or larynx. Albuminuria is not infrequently met with in pseudodiphtheria, but the subsequent paralysis only in diphtheria. In cases of doubt, however, he adopts the generally accepted procedure, namely, the use of antitoxin. The latter half of the paper deals principally with true diphtheria along the lines which have been generally accepted in recent years.

Argyrol in Ear, Nose, and Throat Diseases.—E. B. Gleason¹ (Philadelphia) reports argyrol as a most valuable adjunct to our list of local remedies; owing to its nonirritant and adherent properties and solubility in water, it makes an excellent application to inflamed mucous membranes to modify perverted secretion. In 50 % solution it has

¹ Laryngoscope, Oct., 1903.

proved very effective in chronic indolent suppuration of the middle ear, and is especially recommended as a local application in 20 % solution in cases of atrophic rhinitis. In chronic pharyngitis, laryngitis, and follicular tonsillitis it has obvious advantages over silver nitrate and the other astringents usually employed.

Soda Salicylate in Exophthalmic Goiter.—M. Chibiel¹ reports benefit derived from the administration of soda salicylate in Basedow's malady. He prescribes 1 dram daily in vichy water. M. Babinsky reported at the Société de Neurologie, at Paris, 3 cases, of which 2 were accompanied with intense tachycardia—120 to 140 pulsations a minute. After a few months of salicylate treatment the pulsations fell to 80 and the trembling disappeared. In the third case, in which the only symptom was goiter, the enlargement entirely disappeared at the end of 3 months.

Cancer Treated by the Röntgen Ray.—Arthur Ames Bliss² (Philadelphia), in a report of 2 cases treated by the röntgen ray, states that it is the fate of new methods in medicine and surgery, although received with doubt and suspicion when first advocated, soon to achieve a false reputation for efficiency and become a fad of the day. Then, as a result of application and failure, often in cases in which benefit from their use could not with reason be expected, they are condemned unjustly and the new method is declared a failure. From this he concludes that every mode of treatment has naturally its limit of application, which can be learned only by clinical experience, by process of exclusion after trials and failures, until the range of its action is learned definitely. After continued treatment on the cases reported he states that in each instance the great body of the neoplasm has apparently followed the course of infiltration and necrosis that belongs to its nature, unaffected in the least by the röntgen ray. He concludes that this method as now employed can have little influence for good on malignant growths within the nasal chambers, although gratifying results are undoubtedly obtained in cases of superficial epithelioma, lupus vulgaris, and rodent ulcers. In cases of an inoperable character the method appears to give some relief to pain originating in the superficial parts of the growth, and gives the patient a certain amount of encouragement in his hopelessness in that something is being attempted to relieve his condition. Finally, however, when a radical operation can be performed with a reasonable hope of success, the surgeon should not dissuade himself or his patient from such operative treatment, on the ground that the röntgen ray, as developed in its application at present, will offer an effective substitute for the knife and curet.

Mouth-gag.—Cole-Baker³ (Southsea) has devised a mouth-gag which he describes as follows: The gag is made in the form of a forceps, the front ends of which are fitted with grooves to fit on the gums or teeth. The point in which it differs from other gags consists in making the front limbs with 2 pivotal joints so arranged that when the gag is fixed in the

¹ Med. Press, Aug. 19, 1903.

² Trans. Am. Laryngol. Assoc., 1903.

³ Brit. Med. Jour., Sept. 19, 1903.

mouth, the handles can be bent round laterally out of the way of the operator. Many mouths, owing to absence of teeth in the upper or lower jaw, offer great difficulties for the ordinary gag, which difficulty he claims is obviated with this instrument. The handles of the instrument are so slender that with the ordinary face-piece gag can readily be given for the extraction of teeth, allowing the operator to pass rapidly from one side to the other by simply turning the handles laterally on

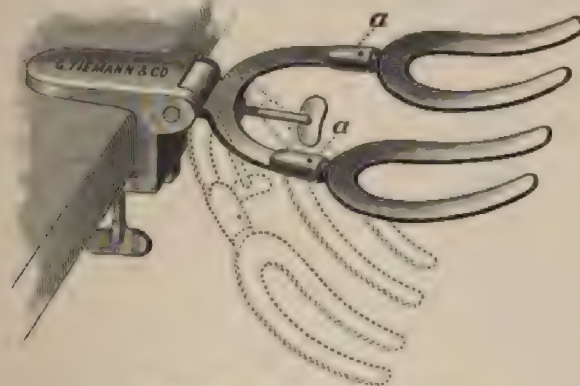


Fig. 72.—Wallace's portable head-rest.

their pivotal joints. The limbs are held in the proper position required by means of a ratchet arrangement.

Portable Head-rest.—Henry Wallace¹ (Brooklyn) has designed the head-rest which is here represented, to be used in house-to-house operating in throat cases where the horizontal position is employed (Fig. 72). It is simple, strong, and compact, may be attached to any kitchen table, and does away with an extra assistant to steady the head.



Fig. 73.—Duke's improved tongue-depressor and throat-insufflator (Brit. Med. Jour., Nov. 4, 1903).

The swivel joints at *a, a*, make it adaptable to any size of head, and by means of a fixation-screw may set at any angle.

Improved Tongue-depressor and Throat-insufflator.—Alex. Duke² (London) considers that the instrument herein illustrated (Fig. 73) is an improvement on the older patterns in 2 points, namely, that it is all of metal and has no rubber tubing or bellows. Any powder preferred can be applied with the insufflator.

¹ N. Y. Med. Jour., Oct. 17, 1903.

² Brit. Med. Jour., Nov. 4, 1903.

A Modified Laryngoscopic Mirror.—Ian Struthers Stewart¹ (Ban-chory, N. B.) suggests that for those who suffer from myopia, and more especially hypermetropia, the following addition to the forehead mirror of the laryngoscope may be found useful. The addition consists of a circular metal plate carrying various plus and minus lenses, riveted to the metal back of the forehead mirror in such a manner that any required lens can be brought into position behind the aperture. This apparatus he believes will be found much more satisfactory than the method of wearing eye-glasses and having the mirror in the center of the forehead.

DISEASES OF THE EAR.

Technic of Operations on the Temporal Bone in Suppurative Middle-ear Disease.—P. McBride² (Edinburgh) read a paper taking up the subject from the time of the first operation recorded and dealing with the subject principally from a **historic standpoint**, from which he draws many interesting and practical deductions. As far back as 1792 Arneman, of Göttingen, quoted by Roosa, laid down the following indications for boring through the mastoid process, as he called it: (1) In any case of absolute deafness or in any case where the impairment of hearing is constantly increasing and for which all other remedies have been used without effect. (2) When, in case of an ulcer or suppuration of the ear, the morbid material has become collected in the cells of the mastoid or the cells have become carious. (3) If the normal mucous secretion has become hardened or collected in excessive quantity. (4) In cases where pain and noise, which finally destroy the hearing, have existed in the ear for a very long time. (5) In cases of stoppage of the Eustachian tube not remedied by injections. Following this the operation lapsed for many years, and an abortive attempt by Dezeimeris, of Paris, to revive it with a view to relieving deafness failed, although he collected 14 cases, in which he reported 9 with entirely satisfactory results as regards the hearing. At this point McBride states that it is difficult to avoid speculations as to whether human nature has changed since 1830, or whether, in the glowing accounts of more modern surgery, allowance should not often be made for the enthusiasm of the pioneer or the unconscious bias of the ardent advocate. To us it must be interesting to note the verdict upon the mastoid operation given by our greatest workers of the middle of the last century, Wilde and Toynbee. The former wrote: "In 1793 Jasser revived the old operation of perforation of the mastoid process for the purpose of injecting the middle ear; but as the success attending this procedure must be very doubtful and the hazard very great, it is never resorted to in the present day." Seven years later Toynbee defined his position as follows: "I have never performed this operation, but I should not scruple to do so in a case where the life of the patient was threatened." The actual methods of operating employed by these pioneers of mastoid surgery were various. The early efforts seem sometimes to have con-

¹ Lancet, Nov. 21, 1903.

² Brit. Med. Jour., Oct. 31, 1903.

sisted of breaking down already carious bone with a probe, while in cases in which this was not possible, trocars or borers were employed. From these earliest operations and methods he proceeds to more modern teaching, devoting considerable time to the views of Schwartze and Staacke, whose methods are now perhaps the most generally employed. The methods of closing postauricular openings are discussed, and operations upon the lateral sinus, the latter dating from recent times. To this historic sketch he adds the history of 8 cases from his own notes, from each of which he draws practical deductions illustrating the major points intended to be emphasized. Following McBride's paper Arthur Hartmann (Berlin) discussed practical points relative to both **acute and chronic inflammatory conditions** of the mastoid process, with preparations and illustrations. In the same report follow numerous discussions by other men, most of them touching on points brought out in the papers of McBride and Hartmann.

The Treatment of Acute Suppurative Otitis Media.—S. MacCuen Smith¹ (Philadelphia) emphasizes the fact that the early recognition and prompt treatment of acute inflammatory diseases of the organ of hearing are among the most important duties devolving on every practitioner of medicine. It is impossible to differentiate between acute catarrhal and acute purulent otitis media until the stage of perforation becomes manifest; hence the treatment to be applied during the hyperemic or acute stage is identical in each. In the interest of effective treatment, however, it is important to distinguish, so far as possible, between an acute otitis media caused by an attack of coryza, or other mild forms of the disease, and that of the more virulent type occurring as a complication or sequel of one of the exanthemas, or from epidemic influenza or pneumonia. The former variety usually yields to the application of the most simple remedial agents if employed during the stage of congestion; while the latter are generally purulent in character and demand prompt and heroic measures for their relief. It is a mistake to assume that the virulence of an aural discharge can be judged by its odor, or that the gravity of an otorrhea can be measured by its chronicity. The moment suppuration occurs, the membrana tympani should be freely incised, carrying the incision from the most bulging point downward to the lower border of the canal, either in an anterior or posterior direction, until about the sixteenth part of a circle has been formed. This will not only provide for good drainage, but will insure the opening remaining patulous long enough to admit of proper after-treatment. Smith considers that paracentesis of the membrana tympani is an ineffectual operation, which has no useful place in aural surgery. After evacuation of the fluid from the tympanic cavity has been accomplished, a good recovery will be made in many cases by cleansing the canal and middle ear with an antiseptic solution, followed by introducing a strip of iodoform gauze well into the deep canal to provide good drainage, this to be renewed every day or two.

The Distribution of Bloodvessels in the Labyrinth of the Ear.—

¹ N. Y. Med. Jour., June 6, 1903.

George E. Shambaugh¹ (Chicago) states that the uncertainty and difference of opinion among anatomists regarding the course of the blood-stream through the labyrinth of the ear, due to the complicated series of cavities that go to make up the labyrinth, have been greatly elucidated since Eichler introduced the method of making celloidin casts in which the circulation could be viewed in its entirety, but even with this accomplished, and with so complete a picture of the blood-supply before one, the complicated network of vessels found in the labyrinth of the adult ear is, in many places, very difficult, if not quite impossible, to disentangle with any degree of accuracy. Through a series of experiments on embryo pigs, making celloidin casts of the labyrinth from preparations that had been previously injected, he draws the following conclusions: 1. But one artery, the labyrinthine, supplies the labyrinth in the ear of the pig. This vessel enters the labyrinth along with the auditory nerve through the meatus acusticus internus. A single vein, the vena canaliculi cochleæ, drains the labyrinth, leaving, along with the canaliculus cochleæ, at a point distinct from that at which the artery enters. 2. The several divisions of the labyrinthine artery which go to supply the cochlea anastomose freely with one another through a number of anastomotic loops or arcades at the base of the cochlea, thus insuring for each part a blood-supply reinforced freely from each division. 3. The arterial supply to the cochlea is arranged on such a plan that, as a rule, the vessels which send out the arteries to supply the scala vestibuli of a coil send out another set of arteries which supply the lamina spiralis of the coil next above. The arrangement usually described for the human ear, where the arteries for the scala vestibuli and for the lamina spiralis of the same coil come from the same vessel, is found in the cochlea of the pig's ear, but only as the exception. 4. The venous blood of the cochlea drains entirely into the vena canaliculi cochleæ. The veins from the ligamentum spirale of the first half of the basal coil are collected into a large trunk which runs along the middle of the under surface of the basal coil, to empty into the vena canaliculi cochleæ. The veins from the remainder of the basal coil are collected into the posterior spiral vein which runs along the posterior inner margin of the coil. 5. The venous blood from the upper coils of the cochlea is collected by a tributary of the posterior spiral vein. This vein, in its beginning, follows the spiral direction of the upper coil. It then passes directly downward through the modiolus to join the posterior spiral vein, receiving tributaries from the upper coils, which converge toward this central vessel. The anterior spiral vein which Siebenmann found in the cochlea of the human ear does not exist in the ear of the pig. 6. The veins which lie between the coils of the cochlea are supplied by 2 sets of tributaries, one of which collects the blood from the scala vestibuli of the coil beneath, and the other from the scala tympani of the coil above. 7. The so-called spiral veins of the cochlea, which are usually described running under the tunnel of Corti, in the crista spiralis, in the crista of the ligamentum spirale, and in the prominentia spiralis, are

¹ Jour. Am. Med. Assoc., Jan. 9, 1904.

formed in the ear of the pig from capillary loops which form the boundary-line for distinct capillary areas in these parts. 8. There was often found in the cochlea of the pig's ear a connection between the vessels of the lamina spiralis and those of the ligamentum spirale. This connecting link consisted of straight veins which ran from the terminal loops under the tunnel of Corti across to the veins in the crista of the ligamentum spirale, and were found in the terminal coil as well as in the basal coil. 9. The arterial supply for the vestibule and the semicircular canals comes in part from the anterior vestibular artery, and in part from arteries which spring from the anastomotic loops between the arterial trunks which supply the cochlea. 10. The venous blood from the vestibule and the semicircular canals is collected into 2 large trunks which empty into the vena canaliculi cochleæ. This is in striking contrast to the condition found by Siebenmann and Eichler in the human ear, where the veins from the semicircular canals left the labyrinth with the aquæductus vestibuli. 11. The capillaries are distributed almost exclusively to the membranous labyrinth. In the semicircular canals this is shown the most clearly. Here the capillaries surround the membranous canal, while the vein runs along its inner concave surface, and the artery, for the most part, clings to the inner concave surface of the osseous canal, sending an occasional twig to the capillary loops around the membranous tube. 12. The capillary loops of the membranous semicircular canals do not, as a rule, completely surround this tube, but leave a zone along its convex surface free from vessels except for an occasional connecting loop which runs across this space.

Removal of the Semicircular Canals in a Case of Unilateral Aural Vertigo.—Richard Lake¹ (London) reports the case of a woman, aged 21 years, who had been the subject of attacks of aural vertigo combined with sickness and vomiting, with gradually increasing deafness and tinnitus, the whole duration of the disease being 5 years. No cause could be found for the origin of the deafness. During the course of the disease she had been under treatment by different physicians and by different methods, and under the care of Lake for 6 months the condition was given a trial by the usual conservative methods. After being under his care without any appreciable improvement for that length of time, an ordinary radical mastoid operation was performed, with the exception that the innermost portion of the posterior wall was not removed, but the bony opening in the temporal bone was enlarged forward, upward, and backward. Anteriorly it was extended into the base of the zygomatic process of the temporal bone, and posterosuperiorly in such a way that the long diameter of the opening was from above downward and forward. The malleus and incus, lying exposed after the removal of the external attic wall, were removed. At this period of the operation the bur was substituted for the cutting gouge which had been previously employed. The next step in the operation consisted in exposing the upper and outer surfaces of the external semicircular canal in its whole extent. The anteroexternal portion of this canal was

¹ Lancet, June 4, 1904.

then followed forward and backward until the outer surface of the superior canal was brought into view. The whole of this canal was then removed by cutting it away with a medium-sized bur, leaving only the upper part of the arch or fornix untouched. The posterior rim of the external canal was then followed so as to bring into view the posterior canal, which was burred away entirely. The wound was packed and closed by the ordinary methods. Following the operation for about 48 hours the patient lay in a position commonly described as that typical of cerebral irritation. By the seventh day, however, she was able to sit up; on the tenth day she could walk with assistance for a few steps, and by the end of 4 weeks she was able to walk without fear of falling. It is now 14 weeks since the operation, and there has been no return of vertigo and the patient is in better health than she has been for several years. The tinnitus was absolutely uninfluenced by the operation, and still remains as bad as before, though the hearing power was very markedly improved.

Chronic Otorrhea.—Chebayev¹ recommends the following: Resorcin and tincture of opium, of each, 60 centigrams; distilled water, 4 grams. The ear should be washed with warm boric-acid solution and carefully dried with absorbent cotton. Eight to 15 drops of the above solution, slightly warm, are then dropped in and allowed to remain for 15 to 30 minutes, the patient holding the head bent over toward the opposite side. A cure may be expected in 3 weeks from one daily treatment. The solution is also useful in external otitis, furunculosis, and acute myringitis.

Treatment of Chronic Middle-ear Deafness by Ozone.—George Stoker² reports favorable results by passing a gentle current of ozone—generated by means of an electric current acting on a Ruhmkorff coil to which the ozonizing tube is attached—through a eustachian catheter into the middle ear for about 4 minutes at a time, the operation being repeated several times a week—daily, if possible. Marked improvement is noted in several cases in the relief of tinnitus and also in the improvement of hearing.

Sympathetic Nerve Deafness.—The British Medical Journal³ asks editorially: Is there, in the case of the ears, any process analogous to sympathetic ophthalmia? The question is commented upon as follows: Apparently the answer must be in the negative, although it is not at all uncommon to observe cases of long-standing suppurative or even nonsuppurative inflammatory disease of one ear in which, at a later stage, the auditory nerve power in the opposite ear becomes defective, this defect being diminished if treatment of the first affected ear is carried out. This may be effected by such methods as the instillation of antiseptics, the removal of polyps, granulations, the ossicles, the outer wall of the attic, or the radical mastoid operation, in suppurative cases; the reestablishment of a healthy condition of the eustachian tubes and tympanic membrane, the tightening-up of relaxed portions

¹ Bull. méd. de Nantes; abstr. N. Y. Med. Jour., July 25, 1903.

² Med. Press and Circ., Mar. 16, 1904.

³ Jan. 23, 1904.

of the membrana tympani, etc., in nonsuppurative cases. This induced auditory nerve weakness in the second ear is by some termed "sympathetic nerve deafness." The mechanism of its production is not very obvious. It may perhaps be induced by a disturbance in the synergic action of the accommodative mechanisms of the 2 ears. In any case the fact has been noted by many writers, and more particularly by Urbantschitsch, of Vienna, and if the pathology suggested is correct, the term sympathetic may be applied to it more correctly than to sympathetic ophthalmia, which is apparently due to an infective process, though the primary lesion, even in this case, may be nervous irritation. In deciding whether a surgical operation should be carried out in the case of any individual patient suffering from disease of one ear, the fact that the hearing of the opposite ear is becoming weaker, presumably from sympathetic nerve deafness, would be an additional argument in favor of operation.

Prognosis and Treatment of Chronic Deafness.—Philip D. Kerrison¹ (New York) divides chronic deafness into 2 general classes, to one of which every case must be referred, namely: (1) Labyrinthine deafness, or deafness due to disease of the labyrinth or auditory nerve; (2) tympanic deafness, or deafness due to disease in some portion of the conducting apparatus, i. e., external meatus, drum membrane, ossicles, or eustachian tubes. Deafness due primarily to labyrinthine disease is comparatively rare, which is the more fortunate since the prognosis in the majority of cases is doubtful and often positively bad. Labyrinthine deafness is not considered in this paper. The large majority of cases of chronic deafness, then, are of tympanic origin, and may be considered under the following heads: (1) Chronic tubal catarrh, in which there is marked narrowing or actual stenosis of the eustachian tubes. (2) Chronic hypertrophic catarrh of the middle ear, in which the tympanic mucosa and all the joint structures of the ossicular chain may be involved. (3) Suppurative processes within the middle ear, resulting in partial or complete destruction of the drum membrane, malleus, and incus. (4) Chronic hyperplastic otitis, also spoken of as "dry catarrh" or sclerosis of the middle ear. Each of these conditions is dealt with in regard to prognosis and treatment, and in answer to the question, What can be done for the relief of chronic deafness? he draws the following optimistic conclusions: (1) There are certain cases of advanced catarrhal deafness—even among those in which no evidence of serious labyrinthine involvement can be found—which do not respond to treatment. (2) In the large majority of cases the power of audition can be distinctly improved. (3) In the early stages of catarrhal or tympanic deafness the majority of cases are susceptible of practical and complete cure. (4) In advanced stages of catarrhal deafness rational treatment often results in an improvement, which adds greatly to the patient's enjoyment of life, though the normal hearing power may never be regained. (5) When but slight improvement of hearing is accomplished, the result of treatment is often of value

¹ Med. Rec., Nov. 21, 1903.

to the patient in arresting a process which might otherwise lead to very marked or total deafness.

Tuberculosis of the Middle Ear with the Report of a Case.—Z. L. Leonard¹ refers to the fact that when the ear is the seat of a tuberculous process, it may precede a general systemic infection which later develops in the lungs or in parts remote from this location. Usually it is secondary to an attack in other quarters which has progressed to an advanced stage. As to the symptoms, the grayish spots in the membrana tympani before it has ruptured; the multiple perforations; the rapidity with which the bone yields to disintegration, and the absence of pain, are a combination of great importance. Tuberculosis has been found primarily in the mucous membrane of the middle ear and in the spongy tissue of the petrous portion of the temporal bone. The aspect of the perforation through the membrane is diagnostic, there being most usually two or even more which soon run together. Deafness is noticed early and is progressive. The treatment must be similar to that which would be pursued in any case of purulent discharge from the ear—antiseptic, stimulating, or by using astringents. Active measures should also be taken to build up the general lowered vitality. A typical case is reported in which both ears were affected and later the lungs became involved. It should be a routine practice to submit to the microscopist for diagnosis and verification the products of an unhealthy discharge, not alone from the upper air-passages, but from the ears as well.

Tubercle-like Bacilli in the Discharge of Chronic Purulent Otitis.—A. De Simoni² says that it has recently been shown that bacilli exist which are quite similar to those found in tuberculosis, so far as morphology and coloring reaction are concerned. They can be differentiated by a peculiar growth on artificial mediums and by animal experimentation. These bacilli occur very frequently in milk and in commercial butter. They were also found present in infusions of several field-herbs and in the feces of herbivora, particularly of milk cows, who let fall the bacilli in the milk during the act of milking, united with minute particles of feces that adhere to the skin. The knowledge of these bacilli is important from a practical point of view, for it is evident that the simple morphologic examination of acid-resisting bacilli is no longer a sufficient evidence nor a proof of the tuberculous nature of the lesion, and does not invalidate the necessity of further researches, which will be sure to demonstrate the widespread occurrence of this tubercle-like bacillus. Acid-resisting bacilli are found in the discharge of purulent otitis; they are nonpathogenic, and resemble bacilli found in milk and in bovine feces. They should not be confounded with the smegma bacilli, which cannot be cultivated on artificial mediums.

Labyrinthine Suppuration.—E. P. Friedrich³ believes that an otitis media may spread to the internal ear by way of preformed passages or by new channels, and that the most common route is either the fenestra rotunda or ovalis. These orifices are normally protected.

¹ N. Y. Med. Jour., July 4, 1903.

² Med. Rec., May 7, 1904.

³ Munch. med. Woch., Feb. 2, 1904.

but it frequently happens that the operator unintentionally removes the plate of the stapes, or that this bone and the ligaments are completely destroyed by suppuration. The most common sites of artificial communication are the ampullary tubercle of the horizontal semicircular canal and the promontory. In all cases, however, an otitis results, which spreads unevenly over the greater part of the labyrinth. Round-cell infiltrations are found upon the vestibular side of the stapes and on the inner side of the membrane of the round window; later connective tissue with lime infiltration will be formed here. Ultimately the endolymphatic system will be invaded, but primary disease here is rare. All the cases observed died of suppurative meningitis, which is best explained by the communication between perilymphatics and subarachnoid spaces, through the aquæductus cochleæ. The sheaths of the acoustic nerve may act in the same way, but the endolymphatic duct is of less importance, since the perilymphatic space is always diseased first. Sometimes the meningitis develops through the agency of an extradural abscess, when the labyrinthine caries brings about defects on the inner side of the organ.

Middle-ear Suppuration in Relation to Life Insurance.—Wendell C. Phillips¹ (New York), as a result of communications from 30 of the leading life-insurance companies of New York, comes to the following conclusions: (1) That acute suppurative otitis media in an otherwise healthy person should not debar him as a safe risk beyond the time necessary for his recovery, which, under proper treatment, should not be more than 3 or 4 weeks. (2) Recurrent suppuration of the middle ear, especially in early life, is usually due to some form of intranasal disease, especially adenoid vegetations of the vault of the pharynx and hypertrophied tonsils. This is usually curable by proper attention to the intranasal defects, and experience would bear out the statement that the cure is permanent and therefore should not interfere as a menace to life. Such applicants should not be delayed after a reasonable time subsequent to thorough operation. (3) A large proportion of the serious intracranial complications, especially from the life-insurance standpoint, occur in chronic suppurative otitis media. The statistics reported in this paper indicate that such complications are of sufficient frequency to render this condition a somewhat serious menace to life. (4) Continuous discharge with foul odor is indicative of more or less extensive necrosis. Applicants with such discharge should be considered bad risks under all circumstances until a cure has been effected, either by local treatment or by radical operative interference. (5) Large perforations and apparent free drainage, while militating in favor of the patient, should not be considered in any manner as a guarantee against extension of the necrotic process to the deeper and perhaps vital structures. (6) In special cases, where large amounts of insurance are desired, the opinion of expert otologists should become of value in deciding the degree of danger in the individual case. (7) Radical operative interference is destined to become an important factor from a life-insurance standpoint.

¹ Brooklyn Med. Jour., May, 1904.

A Model Ear for the Practice of Otoscopy.—J. B. Ball¹ (London) suggests the following form of a model ear which he has had constructed for teaching purposes. It is made of a composition which lends itself to the necessary manipulation. A slit is cut in the wall of the meatus, so that the disks containing lithographic reproductions of various conditions of the membrane and middle ear can readily be inserted. Two model ears, a right and a left, are supplied. The series of illustrations comprises 25 for the right ear and 25 for the left. Among the conditions illustrated are the normal drum membrane, inflamed conditions,



Fig. 74.—Jack's mastoid and auricle retractor.

retraction, opacities, perforations, etc., the drawings having been made especially for this purpose. A brass stand, which is jointed to allow of the ear being tilted to the desired angle, is fixed by a clamp to a table. The auricle is drawn upward and backward and the inspection is made with the aid of the frontal mirror or the otoscope.

A Mastoid and Auricle Retractor.—Frederick L. Jack² (Boston) states that the mastoid part of this instrument is a modification of Allport's retractor and Jansen's mouth-gag. The additional simple device to hold the auricle is thought to be new. The following cut



Fig. 75.—Frey's improved retractor (Jour. Am. Med. Assoc., May 14, 1904).

(Fig. 74) illustrates the advantages of the instrument. There are 3 sets of blades, varying in length to fit different lengths of incision. Two sets only are recommended. The teeth are placed close together, and with the blades in position the edges of the wound are widely separated so as not only to afford sufficient room for operating, but to control hemorrhage. The tip (A) is simply a thin piece of metal adjusted to a groove in the head of screws. Both heads (B, B) are grooved so that it can readily be used for the right or the left ear.

¹ Brit. Med. Jour., Nov. 28, 1903.

² Boston M. and S. Jour., Sept. 17, 1903.

An Improved Retractor for the So-called Radical Operation on the Middle Ear.—Hugo Frey¹ (Vienna) states that the instrument shown in the illustration (Fig. 75) has proved useful to him in making a complete opening into the tympanic cavity. He claims that it facilitates the removal of the posterior wall of the bony meatus and the outer attic wall. The curve of the hook is made with reference to the anatomic configuration of the parts, so that it retains the membranous meatus close to the anterior walls of the bony canal, the lateral projections holding back the adjacent parts of the auricle.

¹ Jour. Am. Med. Assoc., May 14, 1904.

ORTHOPEDIC SURGERY.

By VIRGIL P. GIBNEY, M.D., AND J. HILTON WATERMAN, M.D.,

OF NEW YORK.

THE SPINE AND THORAX.

Arthropathies of Locomotor Ataxia.—G. R. Elliott,¹ before the Orthopedic Section of the New York Academy of Medicine, presented several patients showing this condition. He said that in the first patient the left knee was the only joint affected, showing a knee bursa, which should not be confounded with genu valgum. The second patient shown was a man 57 years of age, confined to a wheeled chair. The joints involved were the first joints of the fingers and the first phalangeal joints. These deformities were globular in shape, painless, and devoid of swelling, and had been so from the beginning. The patient, in his wheeled chair with locomotor, placed the heels of both feet behind his head, demonstrating a condition, common in locomotor ataxia, known as muscular hypotonia. Only 3% to 4% of all tabetic patients manifest arthropathies. Statistics show that the affected joints are much more frequent in the lower extremities, and not at all common in the small joints seen in the two cases presented. V. P. Gibney said in those cases he had seen, the laxity of ligaments was in the ankles and knees. One case shown by Elliott was interesting because of the neuralgia in the internal plantar, and failure to get relief after section of the nerve, but he presumed that the tabes from which the man suffered was, no doubt, a case of metatarsalgia. R. Sayre said that he had many cases in which the patients could walk around comfortably with lateral support on knees, when they were incapable of standing without this support, the ligaments being so relaxed. In these cases the joints are very prone to luxate. Brewer said that he was interested in the case reported, as he had treated similar cases.

Carcinoma of the Spinal Meninges Secondary to Cancer of the Breast.—Pearce and Kulekley² report a case with the pathologic findings in the autopsy. According to the observations of the authors the principal characteristic feature of carcinoma of the spine is pain.

Preliminary Study of Funnel Chest.—T. C. Baldwin³ reviews the entire literature of this subject, and describes briefly his own cases. He believes that intrauterine pressure may account for some congenital cases, such as 2 that have been mentioned. In acquired cases he believes

¹ Med. News, Mar. 19, 1904.

² Jour. Am. Med. Assoc., Feb. 20, 1904.

³ Am. Jour. Orthopedic Surg., Aug., 1904.

the suggestion of Schmidt in regard to his case, that it might be due to an osteomalacia, as we do have an infantile osteomalacia, as well as the same disease *in utero*.

Malposition of the Head and Resultant Ill Health, Spinal Curvature, etc., Due to Eye-strain.—G. M. Gould,¹ in a paper on this subject, states that an investigation of the significance and suggestiveness of the ocular causes of inclined or tilted heads, and of many cases of resultant spinal curvature, will probably throw much light upon other obscure problems of ophthalmology, neurology, and especially aid in the practical solution of many difficulties of practical refraction work and of the daily lives of patients. One can foresee how it may be one of the causes of heterophoria of all kinds, especially cyclophoria, or a number of chronic inflammatory conditions of the fundus of reflex ocular neuroses. It must certainly explain many of the failures to cure migraine, hysteria, neurasthenia, and many other reflexes. Ocular neuroses, even after the most painstaking tests, without the knowledge of a slightly variant axis of the canted, tilted, or abnormally poised heads, may not be intelligently treated, and the extent to which this knowledge may influence ophthalmic and general medical practice seems incalculable.

Lumbar Pott's Disease.—H. Gibney,² at a meeting of the Orthopedic Section of the New York Academy of Medicine, presented a child of 20 months which had been referred to him as a case of lumbar Pott's disease. No disease at the spine was, however, found, but a very marked scorbutic condition, in addition to a general rachitis. The scorbutus responded quickly to treatment, and the long anterior rachitic spinal curve is yielding to a perfectly fitted frame, upon which the child has been placed.

Unusual Case of Pott's Disease.—S. L. McCurdy³ reports a case of a young man, aged 18, with an acute periosteitis of the anterior surface of the axillary bone, which was followed by infection of the orbital cavity, with complete destruction of the eyelid. Secondary infection developed, the most important feature being a destructive disease of the lower dorsal vertebrae, which ran an acute course. The destructive process extended over a period of 3 years, when abscess developed which occupied the left half of the abdominal cavity. A cough developed, and considerable pus was expectorated. It was not thought that the abdominal abscess had anything to do with this, but it was concluded that there had been a secondary deposit in the lungs. The abscess appeared below Poupart's ligament, and was incised and irrigated daily with hydrogen peroxid. Methylene-blue was added to sterile water, and irrigation from below Poupart's ligament caused the patient to expectorate colored matter, proving conclusively that there was a continuous passage from the anterior surface of the thigh through the abdomen and lungs, through which passed bile.

The Present Status of the Treatment of Lateral Curvature.—J. Teschner⁴ says that he has not retreated from the opinion that he

¹ Amer. Med., May 21, 1904.

² Med. News, Mar. 19, 1904.

³ Am. Jour. Orthopedic Surg., Feb., 1904.

⁴ Med. Rec., Dec. 26, 1903.

held in 1895 as to the value of his method in the treatment of curvatures and rachitic deformities, but has become more and more enthusiastic as to its value by reason of his results and their rapidity, and is firmly convinced that it will, in time, be the only mainstay of physicians to treat scoliosis. In closing he says that it might be well to direct the attention of the general practitioner to the necessity of carefully and understandingly examining the children whose posture and gait are faulty, and to advise the proper treatment for them, and to explain the difference between ordinary gymnastics and proper treatment, and he thinks that a few months' care would suffice to bring about an improvement and a stimulation to proper growth, development, and carriage.

Congenital Deformity of the Neck Resembling Torticollis.—

R. Sayre,¹ before the New York Academy of Medicine, presented a patient illustrating this condition. When the child's head was well bent to one side one felt some hard, solid substance down in the neck, which was either a very long transverse process or else possibly some supernumerary ribs. The distance was very much shorter than it should be between the ears and neck, and the röntgen ray showed that the vertebrae had coalesced. R. Whitman said that he had seen a case recently very similar to that shown. He would suggest as an explanation that the malformation was an incomplete cervical spina bifida, the vertebrae being extended laterally as well as otherwise destroyed. The torticollis was, of course, an incidental effect of the underlying malformation.

Forcible Correction in Lateral Curvature of the Spine.—

R. W. Lovett,² before the Boston Society for Medical Improvement, said that the problem to be met in the treatment of severe lateral curvature with fixed bony change is perfectly definite. A fair understanding of the obstacles to be met and of the means at our disposal for meeting them is essential to successful treatment. Gymnastic treatment, after forcible correction, and in connection with effective support, is of the greatest value, and may well be considered one of the essentials of successful treatment. There are two aims in treatment to be kept in mind in this as in every other form of treatment: the spine must be made more flexible and the muscles must be developed to hold the improved position made possible by this increased flexibility. The treatment may be, therefore, divided under two headings: (1) Flexibility; (2) contraction. Lovett stated that the question of the operative relief of scoliosis is still under consideration. The latest and best correction has been obtained by Hoke. As regards braces and corsets, it is pretty generally admitted that the corrective effect of braces in straightening the curves in severe cases is a very slight one. Some excellent operative illustrations are given. Lovett believes it to be of great advantage to have the lumbar curve held by the jacket as flat as possible, and therefore thinks that a corrective extending force is exerted on the dorsal curve. The claim of efficiency to be made for the apparatus which he advises is that (1) the most economic use possible is made of the corrective force by applying

¹ Med. News, Feb. 27, 1904.

² Boston M. and S. Jour., Mar. 17, 1904.

it sideways; and thus less force is required, and with the same amount of force there will be less extension of the spine; (2) that force is applied to the splint while slack, and not made tense by extension; (3) side correction is made by one side of the appliance; (4) correction rotation is made by another part of the appliance. Finally, it may be said that general pathologic considerations seem to indicate that retention in the corrective position should induce changes in the shape and relations of the misshapen bones.

A Further Contribution to the Study of the Scoliosis of Sciatica.

—Ehret¹ presents further arguments and illustrative cases to sustain his theory that this scoliosis is due to the position of the leg maintained by the patient in order to relieve the pain, with fixation on the part of the spine to render it more forcible.

The Scoliotone: An Apparatus for Inaugurating a Lessened Rotation of the Spine in Lateral Curvature.—C. Reilly,² at the meeting of the American Orthopedic Association, presented this instrument, which consists of two padded and adjustable trusses, upon which the upper thorax and pelvis are supported with the legs at right angles to the body. On the end of each bracelet is a padded upright, which causes counterpressure against the axilla of the pelvis when the weights are applied. A strap and arm, with hooks to hold the weights, pass over the convexity, being made fast to the machine on the side of the cavity of the curve. This machine differs from Belly's in that it has fixed supports for the thorax and pelvis, while in his machine the patient rests on the feet and elbows. Patients can remain in this machine for a more prolonged period than in the majority of corrective appliances, and Reilly has found it most helpful in the treatment of this class of cases, claiming that it overcomes supination of spine, anterior and posterior, from end to end, straightens the abdominal muscles, and, by means of the padded straps, tends to overcome the rotation of lateral deviation.

Specimen from a Case of Marie's Disease.—Elliott³ presented a spinal column from a patient which was most typical of the disease described by Marie. The patient had suffered from acute pain in the coxofemoral joint, with great hyperalgesia.

Scoliosis Theory.—Zuppingers⁴ theory is that pressure against the side of the thorax anteriorly will produce a scoliosis, and finally also a twist of the vertebrae. It is based upon a large number of observations and measurements of normal and abnormal thoraxes.

Study of a Case of Lateral Curvature of the Spine, and Report of an Operation for the Deformity.—M. Hoke⁵ presented this report by invitation at the meeting of the American Orthopedic Association. He describes the operation in detail, and concludes that in the future lateral curvature with osseous deformity must be treated as follows: (1) Exercise must be taken in order to do away with all contraction of the

¹ Jour. Am. Med. Assoc., May 7, 1904.

² Med. Rec., Mar. 19, 1904.

³ Jour. Am. Med. Assoc., Apr. 2, 1904.

⁴ Zeit. f. orth. Chir., xi, 280.

⁵ Am. Jour. Orthopedic Surg., Nov., 1903.

ligaments, contraction and muscular resistance to flexibility, and to build up the general health. (2) The flattened side of the back must be operated on, so that side forces applied to the spine may be so weakened, and the ribs made so flexible, that the plane of the thorax beneath the shoulder may be changed to as near the normal as possible. (3) A series of jackets must be applied, using the prominent side as a joint to which to apply pressure to obtain counterrotation. (4) The curves in the ribs on the prominent side must, by operation, be restored to as near the normal as possible, in order to do away with the prominence and to restore the natural plane of the thorax beneath the shoulder.

Congenital Absence of the Collar-bone.—Gross¹ reports such a case. The defect was accidentally discovered, as the shoulder gave no appearance of abnormality. There existed also other bones with defects, so that the case is probably to be considered as a true arrest of development.

Creaking of the Scapula.—Kuettner² says it may be physiologic, in which case a slight friction-rub is present, or movement of the scapula on the thorax. He divides the condition into 3 groups: those caused by abnormal moving projections on the elevation of the scapula; changes in the muscular system of the scapula or thorax; or bursas between the thorax and scapula. He describes 22 cases to illustrate the history of these different groups.

Acute Infectious Osteomyelitis and an Acute Suppurative Perimenigitis.—J. R. Hunt,³ at the meeting of the Orthopedic Section of the New York Academy of Medicine, read a paper on this subject. In the discussion that followed V. P. Gibney stated that more cases should be recognized than had been in the past. He thought that the points emphasized in the paper, early recognition and prompt surgical measures adopted for relief, are very opportune, as when the conditions were recognized earlier the mortality was much less, because their acute infectious nature was understood. Brewer said that he had seen only 2 such cases, and he regarded Hunt's paper as being most valuable from a surgical point of view. In each of his cases there was a perirenal abscess. Pus was found to issue from opposite vertebral bodies. In both cases there was extreme sepsis. He supposed at first the trouble came from the kidney. After exploring the kidney and finding it normal he made a small opening in the psoas, then into the vertebral column, and removed the sequestrum.

Extirpation of the Tensor Vaginæ Femoris for the Correction of Internal Rotation in Spastic Paraplegia (Little's Disease).—V. P. Gibney,⁴ at the annual meeting of the American Orthopedic Association, read a paper on this subject. He said that the persistence of pigeon-toe, depending on internal rotation, is well known to both neurologists and to the orthopedic surgeon. We are able, by myotomies and myo-clases, to correct the crural adductor at the equinus, so prominent in

¹ Abst. Am. Jour. Orthopedic Surg., Feb., 1904.

² Deut. med. Woch., Apr. 7, 1904.

³ Med. News, Mar. 19, 1904.

⁴ Am. Jour. Orthopedic Surg., Aug., 1904.

these cases of spastic contraction or spastic paraplegia, known as Little's disease. The transplantation of tendons has been made to overcome the remaining rotation. Extreme overcorrection by means of force and of internal rotation has often been resorted to, and this position has been maintained for months, with usually a relapse sooner or later. Gibney described a case which he had treated, and said that he had no difficulty in finding the body of the muscle and detaching it from the crest of the ilium, and through the curved incision all except the tendinous attachment was removed, and the wound closed with catgut. There was very little hemorrhage, no ligatures were necessary, and the limb was put up without rotation, plaster-of-paris being applied from the ball of the foot to the 3 ribs. This operation was repeated on the other side about a month later. It is, of course, too early as yet to predict the result; yet, theoretically Gibney feels that he is justified in assuming that paraplegic internal rotation will not recur, and that the child's gait will improve more rapidly by having the strong internal rotator removed beyond return.

THE ARM.

Nerve Anastomosis for the Cure of Infantile Palsy.—J. K. Young,¹ before the American Orthopedic Association, reported a case, describing the operative technic in detail. He concludes that there are two factors to be considered in the selection of suitable cases: the time which has elapsed since the occurrence of the palsy, and the reactions of the muscles to the electric currents. As regards the possibilities of the operation, Young states that its future can only be speculated upon, and a careful selection of suitable cases is the most important element of success, but from the results already obtained, believes that the future will open a very gratifying field.

The Heidelberg Splint: A New Bandage.—O. Vulpius² described a splint composed of an aluminum stem, rectangular in shape, and of aluminum braces of different lengths, each of the latter having a slit in the middle of its long diameter to allow the introduction of a stem. Although the stem is indurated and firm, it can be bent on both surfaces. The advantages of this new instrument are that the same two materials can be used to construct a small splint for the head, and simultaneously a splint which will allow the fixation of the trunk and the head at the same time—an aim which heretofore could be accomplished only with great difficulty. The fact that the bracelets are adapted to the surface of the pelvis gives this instrument the stamp of the shoulder splint of Hessing. This splint can be very thoroughly cleaned and even sterilized.

Substitution of Piece of Ivory for the Bone Diaphysis of the Radius.—Vogel³ describes a case where the diaphysis of the radius is destroyed, but the periosteum and ends of the radius remain, and a piece of ivory was substituted in its place.

¹ Am. Jour. Orthopedic Surg., Aug., 1904.

² Am. Jour. Orthopedic Surg., Aug., 1904.

³ Deut. med. Woch., 1903, No. 12.

Results of Extirpation and Hygroma of Tendon-sheaths of Hand.—Zöppritz¹ reports 35 cases treated by this method. In more than one-half of the cases the function of the hand was perfectly restored, and Zöppritz considered the results very satisfactory.

THE HIP.

Case of Congenital Supracotyloid Dislocation of the Hips with Cross-legged Progression.—H. L. Taylor,² before the meeting of the American Orthopedic Association, reported such a case, illustrating this condition. He stated that cases of congenital upward dislocation are not very common, and the association with congenital foot deformities is not usual, but the principal interest of the case lies in the well-marked and effective cross-legged progression, which is exceedingly rare in congenital hip cases. In this case it was no doubt due to the great amount of adduction, but possibly in part to more favorable use of the deformed feet when crossed.

Infectious Arthritis.—J. E. Goldthwait³ has reported a number of cases presenting this condition. One case suggests an influenza or a severe cold, with a toxemia following in which the joints were involved; in another the joint symptoms were due to a pneumococcus; still another represented quite typically a disease described by Still, except that it was of a milder type than the case reported by him. From the most careful study of the disease it suggests an infectious process, the infection most probably having been absorbed from an abscess about the tooth.

A Consideration of the Ultimate Results of the Bloodless Replacement of Congenitally Dislocated Hips.—J. Ridlon,⁴ before the New York Academy of Medicine, stated that in selecting the subject he had been actuated by diverse motives, but chiefly by the hope that a straightforward presentation of the facts in so far as he had been able to obtain them might correct certain delusions and false impressions that had crept into the minds of medical men and others. He believed that enough hips had been operated upon and sufficient time had elapsed to gain an accurate knowledge of the facts which he wished to present. In bilateral congenital dislocation of the hip he believed this operation to be the only one used in every case, and he did not think that the bloodless replacement of these hips should be condemned if the anatomic replacements did not meet with more than 10 % or 20 % of successes. He divided his cases into 4 groups; in speaking of the attitude of medical men toward bloodless surgery he divided their interest into 4 phases: (1) Indifference; (2) interest; (3) delirium; (4) "The morning after, when things look different." Ridlon mentioned that anterior transposition frequently followed too violent operative measures. It was his belief that in 100 cases 10 % became permanently cured; 60 % would be only partially successful; and 30 % would be failures. The paper was largely discussed by E. H. Bradford, Shaffer, V. P. Gibney, and A. Jacobi.

¹ *Beit. z. klin. Chir.*, Bd. xxix, 1904.

³ *Boston. M. and S. Jour.*, Apr. 7, 1904.

² *Amer. Med.*, Sept. 24, 1904.

⁴ *Med. Rec.*, Mar. 19, 1904.

Twists in Normal and in Congenitally Dislocated Femur.—Bradford and Soutter maintain that, in the treatment of this condition, it is desirable to determine the amount of pathologic twist of the neck of the shaft of the femur. What is required is to measure the amount of torsion of the femur as represented by the position of the line of the condyles and that of the line of the neck. If two planes are revolved through the axis of the shaft until one includes the line of the condyles and the other the line of the neck, the torsion will be the difference in inclination of these two planes; *i. e.*, the dihedral angle of these planes. A full description is given of the methods of determination of these twists. Where much twist is present the manipulation necessary in reduction is different from that which is needed where the amount of twist is small. The influence of the femoral twist and the ultimate result of treatment of congenital dislocation of the hip have, as yet, not been thoroughly investigated.¹

Observations on Hip Disease as Seen among Hospital Out-patients.—A. Thorndyke² stated that, in order to obtain good results, all cases of undoubted hip disease which came to the clinic of the Children's Hospital in Boston 10 years ago as new patients and had remained long under treatment were selected. The conditions which prevail in the out-patient department of any hospital in a large city are by no means ideal. Many practical difficulties exist which are to be mitigated, but cannot be entirely removed. The treatment, however, has varied but slightly. Different forms of splints have been used. Some cases have been treated without traction, but most of them used some modification of the Taylor long traction splint. The Cabot frame was used for little babies 3 times, with good results. The proportion of cases with abscess indicates that this group of hip cases belonged to the severe type of hip disease. The average shortening was $1\frac{1}{2}$ inches; 60 % had 1 inch or less; 83 % had 2 inches or less. Permanent flexion of the hip was studied in 43 cases; a few degrees of permanent flexion was found in 5 cases; 10 % in 7; 20 % in 7; 30 % in 3; 45 % in 3, and more than 45 % in 2 cases; 16 cases showed no permanent flexion present. The figures show that even with poor home care, in an out-patient clinic considerable movement and improvement of the joints may frequently result. A comparison of the results obtained was made with the statistics published by Gibney, Waterman, and Reynolds 5 years ago from the clinic of the Hospital for the Treatment of the Ruptured and Crippled.

Peripheral Palsies Following Manual Replacement of the Congenitally Dislocated Hip.—H. L. Taylor,³ at the annual meeting of the American Orthopedic Association, reported a number of cases. He found, on investigation, that the quadriceps muscle in several cases was completely paralyzed. With the patient seated and the leg hanging there was no power to extend the knee, while the knee-flexors and the foot-muscles showed normal activity. In some cases passive extension was somewhat limited by contraction of the hamstrings, but this did not

¹ N. Y. Med. Jour., Dec. 5, 1903. ² Am. Jour. Orthopedic Surg., Nov., 1903.

³ Trans. Am. Orthopedic Assoc., Feb., 1904.

interfere with extension of the pendent leg. The anterior tibial nerve had evidently been injured by the manipulations.

Supracondyloid Femoral Fracture with Complications.—J. E. Owen,¹ at the Chicago Orthopedic Society, reported 2 cases—one of a man, aged 30, who sustained a simple supracondyloid fracture of the left femur, and the line of fracture on the right side was just above the condyles, which were detached, one from the other, and finely comminuted. The second case sustained a linear fracture, about two inches in length, of the left frontal bone, a fracture of the left knee, and a chipping-off of a portion of the external tuberosity of the tibia and supracondyloid fracture of the right femur, with marked displacement of the lower fragment forward, carrying the patella conspicuously in the same direction.

Anatomic Treatment of Fracture of Neck of the Femur, by which Bony Union can be Secured in a Large Majority of Cases.—J. E. Moore,² before the annual meeting of the American Orthopedic Association, described briefly his method of treatment. The thigh is flexed on the body and lifted up, so as to leave the bending of the psoas iliacus muscles away from the seat of fracture, as it has a tendency to crowd the soft tissues between the fragments. While keeping up the extension of the limb, it is brought down to the normal position, and a pulley of 15 to 25 pounds applied by means of the usual long-sided weighted straps and a pulley at the foot of the bed. Another pulley of 10 or 15 pounds is then applied to the inner side of the upper end of the thigh by a weight and pulley. The inner and under sides of the thigh are protected by the binders' board or felt splint, so that the pressure will be equally distributed. This side pull is a special feature of this treatment. It leads the upper end of the long fragment upward and outward into place, and, by making the capsular ligament taut, forces the short fragment into position. The amount of the weight to be applied is determined by the amount required to overcome the deformity in each case. An ordinary or brass bed will accommodate itself to these elevations, so that the patient's body will act as a counterextension against the weights. The writer has personal knowledge of 3 cases. In discussion Hoffa said that he had the same idea of operation as Whitman. If the deformity is not too great, one should try to overcome the abduction. He believed the old method of treating fractures of the neck of the femur was incorrect. In many cases union does not occur. In other cases there is shortening of the leg, with abduction and outward rotation of the leg, and the patients suffer a great deal from pain. He said that he used a method similar to that described by Dr. Moore. Blanchard said that he believed that rachitic coxa vara occurred oftener than is supposed. Shands wished to call attention to the similarity in the history as regards occupation. The histories of the cases show that the patients have been working for 8 or 10 years, for 8 or 10 hours a day, in practically the same direction, as, for instance, in the case of a tailor or a cutter using a large

¹ Jour. Am. Med. Assoc., Mar. 19, 1904.

² Am. Jour. Orthopedic Surg., Aug., 1904.

iron shears. Shaeffer has reported a number of cases of acute coxa vara in which there was no lesion at the neck of the femur except in distinct bending. He has also had a number of cases, not only as applied to coxa vara, but also as to knock-knee, bow-legs, and curvatures after fractures in adolescence, which prove that a great deal of our operative work is unnecessary and that the treatment is simple. Ridlon said that he had so often described the use of the tongue splint that he would not otherwise refer to it had he not been asked to do so. He described the use of the splint in detail. Many others participated in this discussion.

Distinction Between Fracture of the Neck of the Femur and Epiphyseal Disjunction in Early Life, with Reference to its Influence upon Prognosis and Treatment.—R. Whitman,¹ at the annual meeting of the American Orthopedic Association, stated that the object of this paper is to call attention to two forms of fracture of the neck of the femur, of which an accurate diagnosis may have an important influence upon treatment. Simple fractures should be treated by fixation at the limit of normal abduction, an attitude which implies restoration of the fractured neck to its original position. Partial epiphyseal digression should be treated, if possible, by direct operative replacement of the head. Excision, which is in some favor with German surgeons, should be an operation of necessity rather than of choice. Finally, in view of the fact that normal function is dependent on normal form, we should not be content with mechanic treatment, however efficient it may be in relieving the immediate symptoms, except in those cases in which the deformity is significant. One hundred and twelve cases are reported, illustrating the difference between the two forms of injury, both as to symptoms and treatment. Partial traumatic epiphyseal separations are illustrated by 2 cases, demonstrating the contrast both in symptoms and in treatment.

Operative Treatment of Intracapsular Fracture of the Hip.—C. F. Painter,² at the eighteenth annual meeting of the American Orthopedic Association, read a paper on this subject. He said that he had 4 objects in view in making this report: (1) To emphasize the difficulties of diagnosis in one case, which was one of epiphyseal separation; (2) to emphasize the frequency of this lesion, not only among young people, at the time when growth is rapid and the bones are soft; (3) the principal causes of the failures to unite in these cases; (4) to show the good functional results of the operation. Three cases are described in detail.

Resistance of Tissues as a Factor in the Reduction of Congenital Hip Dislocation.—E. H. Bradford,³ at the meeting of the American Orthopedic Association, stated that it is now universally admitted that the chief obstacle in the reduction of the congenitally dislocated hip lies in the soft parts rather than the bone, and that it is manifestly of practical interest to determine which tissues offer the

¹ Am. Jour. Orthopedic Surg., Aug., 1904.

² Am. Jour. Orthopedic Surg., Aug., 1904.

³ Am. Jour. Orthopedic Surg., Feb., 1904.

greatest resistance. The facts which are presented for consideration may be summarized as follows: (1) The resistance offered to the reduction of congenital dislocated hip by the capsule is not more important than that offered by the muscles; (2) the chief resistance to forcible adduction is from the strong tendon of the adductor magnus; (3) the resistance to pulling down the head comes from the hamstring group and the long tendon of the adductor magnus and iliotibial muscles; (4) usually resistance of tissues can be overcome by small incisions at a distance from the hip; (5) if it be a light case, manual reduction is sufficient; (6) in resistant cases mechanic force, which pulls upon the abductors, arranged so as also directly to act upon the capsule, is of assistance; (7) where the tendon of the adductor magnus is so strong that a moderate amount of force is needed in stretching, it would seem advisable to divide the different resisting tissues, rather than to incur the danger of severely bruising the tissues by the force used. The division of the tendon can be done either before the operation of forcible correction or at the same time.

Congenital Dislocation of the Hip: Report of a Bloodless Reduction Followed by Death, and an Analysis of 23 Cases in Process of Treatment.—H. A. Wilson, J. Torrance Rugh, and W. M. L. Coplin,¹ at the seventeenth annual meeting of the American Orthopedic Association, described in detail this number of cases. In the case that by postmortem examination showed that it was one in which replacement could not have been secured without removing the ligamentum teres, and that there was no way of predetermining the existence of the obstacle to the bloodless reduction, the main factors were the length and size of the ligamentum teres, which more than filled the acetabulum on each side, and therefore the sound which indicates reduction—that is, the slipping-out of the head from the acetabulum as the leg is brought into an extended position—was present. While this one factor—i. e., the ligamentum teres—was sufficient to prevent a reduction, and preventing the clear sound that occurred in other cases when the head, it is believed, entered the acetabulum. The previous condition of the child gave no distinct evidence of her deficient vitality, and it would seem as though the methods employed for reduction were less responsible for her death than the anesthetic, although the entire procedure must be considered. While the condition of the patient did not indicate shock at the cessation of the reduction manipulations, it was felt that the patient should be most carefully safeguarded in every respect. The full details of the examination are given as an essential feature, and their value is enhanced by the disinterestedness with which the report is made, hoping that the conditions, methods, and results will be of service in guiding others in cases of this kind.

Remarks on Treatment and After-treatment of Congenital Dislocation of the Hip.—A. Lorenz² states that as to the technic of the reposition, he has nothing more to add except that it makes very little difference by what method the reposition is brought about, whether

¹ Am. Jour. Orthopedic Surg., Feb., 1904.

² Amer. Med., June 18, 1904.

by the level maneuvers of abduction or whether by extension. The most important rule in the retention is the temporary fixation of the thigh in right-angle reduction. Lorenz describes in detail the after-treatment which he has followed. As regards the bloodless reduction, he believes that the endeavors to increase the upper age-limit are not advisable by the results obtained by forcible reduction of old luxations, and that these results do not make up for the great danger which goes hand in hand with forcible replacement. Putting aside the exceptional case, he still believes that the limit of 9 or 10 years should be the age-limit for reducible unilateral cases, and 7 to 8 years for the bilateral. In individual cases beyond the age-limit reduction has been effected after repeated sittings. He does not favor reducing by degrees in this manner. As we approach the upper age-limits the reduced joints tend to a stiffening which often simulates functional ankylosis. As regards the clinical examination, in establishing the prognosis the röntgen picture is regarded merely as supplementary evidence in the investigation. We cannot form our judgments of the functional results of the bloodless reposition from evidence drawn from radioscopy, or we should come to the unjustified, as well as false, conclusion that the method is valueless in nearly half of the cases, which conclusion is entirely unsustained by those who have had experience. If the functional—that is to say, the practical—result is satisfactory, too much stress must not be laid upon the röntgen picture.

Treatment Following Bloodless Reduction of Congenital Hip-dislocations.—Ashley and Muller¹ present a paper which is intended to deal exclusively with the after-treatment, which may be considered a supplement to a number of articles which have been published dealing with the bloodless reduction of congenital hip-dislocation after Lorenz. These publications have been confined mostly to the details of the operation proper, and to a description of the effects immediately following the operation, and postoperative treatment is fully dealt with in this article. The patient, as a rule, does not feel very much pain during the first twenty-four hours after the operation, because the influence of the anesthetic is still more or less evident. In older cases, where there has been considerable trauma during the operation, it may be necessary to administer some form of opium during the first three nights following the operation. The temperature in the majority of cases does not deviate to any alarming extent from the normal. Slight increases over 100° F. are frequently observed, and generally disappear inside of 24 hours. Subcutaneous injuries to the tissues are another cause of fever during the first days after the operation. In some patients, usually where an old extension of primary position is necessary, an edema of the whole lower part of the limb may develop, due to interference with the circulation. As to the length of time the child will stay in bed, this varies greatly according to the individual. As a rule, 6 to 10 days are sufficient to render the child quite free from pain. At first the walking exercises consist in placing the child in the upright position and teaching him to

¹ N. Y. and Phila. Med. Jour., Apr. 23, 1904.

maintain his equilibrium. After 2 or 3 days of these exercises attempts at walking are begun, in which the patient is assisted by two persons, one on each side. Within a few days the child walks around without any aid, and appears only slightly hampered by the cast. Accompanying the article are some excellent illustrations, showing different positions of the limb after the operation; also figures showing passive extension, limited knee-contraction, and tilting of the pelvis in the walking position. A number of other illustrations show the method of giving the exercises after the application of the second plaster.

THE KNEE.

Snapping Knee.—Homer Gibney,¹ at a meeting of the Orthopedic Section of the New York Academy of Medicine, presented a patient whose knee, on the right side, when extended forcibly, made a sharp noise or snapping. This slipping of the quadriceps extensor is to be considered infrequent in adults.

Subluxation of the Tibia.—V. P. Gibney² reports a case of a boy of 10 with marked flexion deformity and subluxation of the head of the tibia, presenting a long cicatrix below the patella. He thought it, on first sight, a case of exsection of the joint in early life. It was, however, placed on record as malarial synovitis of the knee, and the question was brought up as to whether it was osteitis or pure malarial synovitis. A radiograph of the limb was shown, and attention called to the curving of the lower end of the femur, which takes place in tuberculous lesions of the bone. At the time of operation the joint was opened and the cartilage was found diseased. The quadriceps extensor was cut to get the patella out of the way.

Compound Fracture of the Patella and Condyles.—Halstead³ reports the case of a man who, while riding on the platform of a train, was struck by an iron girder in such a manner as to produce a compound comminuted fracture of the patella. The external condyle was completely fractured, and the joint attached simply by a portion of the external anterior ligament.

Treatment of Chronic Arthritis by Injection of Vaseline.—Burdinger⁴ employs injections in this condition, not of a tubercular or gonorrheal type, with good results. He uses 1 to 4 cm. of heated, sterile yellow vaselin in the knee-joint, 3 cm. in the shoulder-joint, 1 or 2 cm. in the smaller joints. In severe chronic arthritis it brings an evident improvement in many cases.

Treatment of Acute and Subacute Inflammations of the Knee-joint by Apparatus Permitting Locomotion with Protected Antero-posterior Motion at the Joint.—N. M. Shaffer,⁵ at the annual meeting of the American Orthopedic Association, reported 3 cases where such an apparatus had been used. He states that the patients all give the

¹ Med. News, Feb. 27, 1904.

² Med. Rec., Mar. 19, 1904.

³ Jour. Am. Med. Assoc., Mar. 19, 1904.

⁴ Wien. med. Woch., No. 17.

⁵ Am. Jour. Orthopedic Surg., Aug., 1904.

same history as regards the immediate and almost permanent relief. In regard to cases of acute synovitis, he prefers the use of the apparatus, placed as it is in the eccentric joint of the brace. In chronic synovial diseases of the knee he has used the apparatus only once. The apparatus has already been fully described, and a drawing is given in order to demonstrate the pin stop part of the apparatus, which is the adjustable olecranon of the knee-joint.

Value of Bier's "Congestive Method" in Treatment of Joint Tuberculosis.—H. Freiberg,¹ before the annual meeting of the American Orthopedic Association, reported his experience with this method. He states that he has not been able to convince himself of the correctness of this course, and in his cases immobilization and protection have been carried out as heretofore, whereas with Bier's method congestion forms a principal part of the treatment, and no stress is laid upon effective immobilization. From Bier's own report, as well as from his own short second experience with the method, he feels that in a large number of cases it would show that it has a definite value in joint tuberculosis. He does not believe that our efforts in the direction of our well-tried conservative methods should be abandoned or even relaxed, but that the treatment by congestion should be used as an adjuvant only for the present at least. In a discussion Spitzzy said that in a recent paper of Bier's, before the German Orthopedic Association, a new apparatus had been recommended. This consists of a glass cylinder, one end being over a rubber ring. No pressure is made at the junction. A pump is connected with the center of the cylinder, and by this means an intense congestion is produced. Hoffa said that Bier's treatment had not been employed as much here as abroad. He is quite certain that this method is of great value in the treatment of joint tuberculosis. He is using it in the same way as Freiberg.

Surgical Procedures for the Relief of Infantile Paralysis of the Lower Leg.—Dane and Townsend² presented, at the annual meeting of the American Orthopedic Association, the results of their studies in 50 cases. The results seem to show that while tendon transplantation may, in certain cases, yield a satisfactory result, the selection of cases for this operation should be much more careful than it was 3 or 4 years ago, and that for the great majority of hospital cases, either astragalectomy or arthrodesis offers by far the greatest promise for obtaining a strong, useful foot several years after the operation. In discussion H. B. H. Galloway stated that he performed a considerable number of operations for tendon-grafting. An improvement of function had been noticed soon after the dressings had been removed; two months after, in very few cases had there been any permanent gain. He has practically abandoned the operation and returned to the operation of arthrodesis, which he had previously used. J. T. Rugh reported a case of tendon-transplantation after resection of the extensor tendons of the toes. The result was a total failure. A. H. Freiberg said that he be-

¹ Am. Jour. Orthopedic Surg., Aug., 1904.

² Am. Jour. Orthopedic Surg., Aug., 1904.

lieved that operations of tendon-grafting were not so successful as was expected in some cases, because the power furnished by the muscle was used up by the division of the tendon. If this is true, in any case of paralysis sufficient extension and tendinous fixation should be secured; otherwise the result would be a failure, and tendon operations alone are wrong in principle. A. B. Hosworth concluded from his experience that failure has been due to not securing sufficient tension. H. A. Wilson, referring to the statement that the success of the operation depended upon the tension, stated that he had learned from experience that tension was a surgical sin. W. R. Townsend believes that the results of these operations are dependent upon the willingness of the individual to keep up certain movements. The after-treatment, he believes, is the most important part; it should be kept up, not only for one year, but for several years, especially where we expect function. Where we work simply for position that is another matter. H. Spitzzy advised using silk sutures. Hoffa said that tendon-transplantation is a new operation, and that all operations have had failures, but this method must not be abandoned. Experiments on animals and the results in man have clearly proved that results are to be obtained. He advised, in a paralytic joint without muscles, joint arthrodeses with shortening of the tendon. V. P. Gibney stated that he felt that a combination of tendon-transplantation and arthrodeses was very valuable. He has operated on a number of cases, but is not ready to give final report on these, but they now seem to show a perfect result.

Intermittent Hydrops of the Joint and the Influence of Growth upon Deformities.—H. Marsh¹ selected this as a subject for the Ontario lecture. Two cases of intermittent hydrops on the joint are reported. These are described in detail, and, as regards treatment, it may be said that locally nothing seemed to have any definite effect. During the attacks the joints must, perforce, be kept at rest, and the patient is unable to use them; but rest seems to have no effect in preventing or materially modifying the attacks. As regards the influence of growth upon deformity, in 1898, in the Cavendish lecture at the West London Medico-Chirurgical Society, Marsh spoke of the influence of growth in the production and removal of deformity. Since the lecture he had further opportunities of observing the very material part which growth plays in the directions already mentioned, and observation has also led him to believe that the matter is one which has not yet attracted all the attention it deserves. The influence of growth is more often recognized as an agent in the contraction than in the removal of deformities. It will readily be conceded that growth takes place in conformity to type; that, in other words, it is modeled upon and governed by a preordained plane. This regulating influence of conformity to type is, under natural conditions, ceaselessly and strongly at work to produce perfect form and symmetry. In many instances, however, the conditions under which growth is taking place are abnormal. For instance, the bones of the lower extremity in the rachitic child are deficient in rigidity

¹ Lancet, June 4, 1904.

and are easily bent. In these circumstances the influence in conforming to type which should maintain the normal outlines of the bone is opposed by the rachitic condition in opposing normal curves, and then it becomes important to observe what takes place. Should the circumstances be completely favorable, however,—that is, should the child be kept completely, or for the most part, off his feet, so that there is no force at work to prevent the influence of type exerting its full effect in regulating growth,—it will be found that the bones, as the growth proceeds, return, as one may say, spontaneously, to their normal shape. Some queer illustrations of this are mentioned in the article. In concluding Marsh stated that he thought that when the maneuvers afforded by the cases which had been related and the skiagraphs which had been shown are fully appreciated, it will be seen that the action of growth upon the removal of deformity may often be turned to valuable account in the surgery of childhood.

Slipping or Recurrent Dislocation of the Patella, with a Report of 11 Cases.—J. E. Goldthwait,¹ at the seventeenth annual meeting of the American Orthopedic Association, stated that the above condition is seen almost entirely in girls or young women, and is due in large part to the fact that the line of pull of the quadriceps extensor is not straight, this feature being increased in its effect by the natural development of knock-knee from an imperfectly developed articular surface at the end of the femur. Of 11 cases of this condition, 7 were operative, with 13 operations, and 4 were nonoperative and were treated by him. Observations made in connection with the treatment of these cases represent the basis of the paper. In considering such a series of cases it is at once obvious that the number is too small for any obvious conclusions to be drawn. At the same time there are certain features which are suggestive for advocacy in the treatment of other cases. In the first place, the lesions, as stated above, seem peculiar to girls or young women. It is usually associated with flat-foot, which is prominently a factor in the development of the weakness of the knee. True knock-knee is sometimes present. In all the cases the tubercle of the tibia was displaced further forward to the outside than normally, so that the line of pull of the quadriceps muscles tends to distinct bend. One case is reported without treatment, and in this the dislocation became permanent. If an operation is to be considered, the chief point is the straightening of the line of the pull of the anterior thigh muscles. This is best accomplished by transposing the outward half of the patella tendon, so that it is attached well to the inside of the tubercle of the tibia. If the tendon is too long, it can be shortened at the same time the attachment is made. Of the cases treated, 7 were operated on, and 2 of the others are awaiting operation. Of the operative cases, 4 had the lower half of the patella tendon and 1 had the entire tendon transplanted to the inside, and as 3 had both knees straightened, there were 8 operations, with normally strong joints in 7, the ultimate result in the eighth being uncertain, as sufficient time has not elapsed since the operation. Of the 3 cases in which other opera-

¹ Am. Jour. Orthopedic Surg., Feb., 1904.

tions were performed, in one with both knees affected, the capsule was quilted, and the patella tendon was shortened, without transplantation, as well as quilting the capsule, and in one the inner half of the tendon was transplanted as well as quilting the capsule. All relapsed. In one of these a second operation for the transplantation of the outer half of the tendon was performed, with a perfect result.

A Case of Spastic Paralysis Treated by Transposition of Hamstring Tendons; also a Case of Contracture of Hamstring Muscles of Spastic Origin, Relieved by Elongation of the Hamstring Tendons.—Bartow,¹ at the seventeenth annual meeting of the American Orthopedic Association, reported 2 cases in which the above operation had been performed. The subject of the first clinical report, about 11 years old, came under Bartow's care for the treatment of congenital spastic diplegia. In interesting contrast to this case is one of the same type, which is briefly alluded to. Most interest attaches to the difference of development and the mode of treatment which was adopted. A comparison of the posture before operation with that 3 months after will show improvement, and quite accurately illustrates many features of the case.

THE FOOT.

Unique Cases of Congenital Luxation of the Ankle.—A. H. Freiberg,² before the seventeenth annual meeting of the American Orthopedic Association, stated that in all the important cases which he has been able to find congenital luxation of the ankle has been associated with defect of the fibula. These cases have been divided by Hoffa into 2 classes. A case which is heretofore reported belongs in the second class, for the reason that the obliquity of the joint line and the normal condition of the foot and toes are evident. It would appear to be of special interest, however, because the fibula is present throughout its course, being possibly thicker than normal, and because it seems possible to draw rather definite conclusions from it regarding the etiology of this group of cases. The patient is a girl of 24 months. The deformity of the left ankle had been noticed from birth, and its correction had been attempted by desultory courses of manipulation and massage without effect. From the first, attempts at walking were made with great difficulty, but the child had learned to walk with a peculiar limp. The child was so unruly that a radiograph was made only with great difficulty. It was, however, sufficiently successful to show the conditions satisfactorily. It was proposed to do an osteotomy of the fibula, with the hope of bringing down the external malleolus, with possibly the same operation upon the tibia, in order to correct the obliquity of the joint line. All operative interference was, however, declined. In all of its physical characteristics it seemed that this case would correspond to an incomplete form of the so-called Volkmann's "congenital ankle deformity," in so far as the

¹ Am. Jour. Orthopedic Surg., Feb., 1904.

² Am. Jour. Orthopedic Surg., May, 1904.

fibula in its bony structure indicated. It is, furthermore, almost self-evident that the curvature of the fibula against the straight tibia could have been brought about only by pressure upon it against the tibia. In this far the case seems to corroborate the theory of amniotic pressure in the production of defective fibula and the deformities thereupon consequent.

Hallux Rigidus.—J. Sinclair¹ believes that the condition is due to an inflammation of the epiphysis which caps the first phalanges of the great toe-joint at the proximal end. On several cases he has found the epiphysis loosened, and palpation of the joint shows that this part of this opening is the seat of pain and inflammation. Complete ossification of this epiphysis with the injured shaft occurred at the age of 17 to 18. He attributes this ailment as being due to too much walking in boots made with strong, unyielding soles. As regards treatment, he advised rest, without boots, and daily application of iodine for 4 or 5 days.

Flat-foot.—C. L. Darby² describes an appliance which can be worn indoors as a shoe or sandal in the stocking feet, or at night, while the patient is in bed. Walking in these causes no pain or discomfort. A strap is provided to assist in holding the foot in proper position, and is also an additional support, holding it in place. The device consists of a sole piece having a turned-up heel piece against which the heel rests, and a strap attached to the sole piece which passes across the ball of the foot and holds the ball of the foot against the side piece, and prevents it from rising up.

Morton's Painful Disease of the Toe.—Stern³ has reviewed the literature on this subject, and refers to the theory regarding its etiology. He describes a number of cases in detail, illustrating the effect of resection of the head of the deformed metatarsus, with the success which followed it.

The Foot of the American Negro.—Freiberg and Schroeder⁴ said that were the number of observations sufficiently large, it would seem justifiable to draw the following inferences: (1) Flattening of the arch of the foot is much more frequent in the American negro than in his white neighbor; (2) hallux valgus is likewise more frequent in the negro than in the white American; (3) the well-arched foot occurs in the American negro with sufficient frequency to establish it as the normal; (4) while flattening of the arch is more common in the negro child than in the white, the normal foot preponderates decidedly; (5) from this it would be fair to conclude that the flat-foot of the adult American negro has developed after the period of childhood in the greater number of cases. Should future investigation concur with the above findings, it would become necessary to abandon the idea that a flat arch is a hereditary and racial condition of the American negro, but this condition would have to be recorded, in part, at least, as the injurious result of shoes of improper construction.

¹ Brit. Med. Jour., Mar. 26, 1904.

² N. Y. and Phila. Med. Jour., Mar. 5, 1904.

³ Amer. Med., Feb. 6, 1904.

⁴ Am. Jour. Orthopedic Surg., Nov., 1903.

MISCELLANEOUS.

The American Journal of Orthopedic Surgery made its first appearance in August, 1903, under the editorial committee composed of Doctors Lovett, Mackenzie and Sherman.¹ This is to be the official publication of the American Orthopedic Association, taking the place of the former annual volume of transactions.

Orthopedic Surgery.—R. Whitman's² book has appeared in its second edition in two years. It has 1200 pages added. The subjects embraced within its pages are well within the scope of orthopedic surgery. The most approved modern methods of treating existing deformity, as well as a prevention of its occurrence, are based upon sound pathologic and physiologic basis.

Recent Progress in the State Care of Crippled Children.³—In the third annual report of the New York State Hospital for Crippled and Deformed it is noticed that over 350 applications for admission have been received during the year from various parts of the state. The average residence of the discharged patients in the state hospital since it was organized in 1900 is 1 year and 3.6 months. The residence of many of the tuberculous hip-joint and spinal disease patients now in the hospital will be in some instances several years. We understand that it is the intention of the managers of the state hospital to keep the patients admitted to their care under treatment long enough to effect a permanent cure in all the cases where the environment of the patient is unsatisfactory at home, and this means, among the class it has endeavored to reach, for a long time. The ideal hospital for the treatment of deformities among poor children should give them both care and treatment until a cure is effected, or, at least, until the best obtainable result is secured.

N. M. Shaffer has briefly described the **State Hospital at Tarrytown.**⁴ It has a school where the patients are instructed every day. It has a small but beautifully equipped operating-room, with 2500 dollars' worth of operative instruments. It has a shop equipped with 500 dollars' worth of tools and machinery, where ordinary changes and repairs can be made to broken or ineffective apparatus. There is a corps of resident officers, paid by the state, and the state annually appropriates a sufficient sum for maintenance. Although not a large hospital, and the building simply an old house converted into a hospital for temporary use, it is in every sense a hospital devoted to the care, treatment, and education, so far as its limited accommodations permit, of the poor crippled and deformed children.

Chicago Orthopedic Geography.—F. C. Test⁵ states that the title of this paper could, with perhaps more exactness, read "The Physical Geography of Orthopedic Cases in Chicago." Although it is but a preliminary study, the scope and importance merit further investigation of

¹ Amer. Med., Mar. 5, 1904.

² Amer. Med., Mar. 5, 1904.

³ N. Y. and Phila. Med. Jour., Jan. 30, 1904.

⁴ N. Y. and Phila. Med. Jour., Feb. 6, 1904.

⁵ Chicago Med. Recorder, Feb. 15, 1904.

the character of the various deformities found in the different regions of the city, and, secondarily, also of the racial and national characteristics of the individuals affected. Taking up the factor of the individual, some interesting points appear as to the susceptibility of different nationalities to different deformities. Of the cases classed as Americans, about 43 % present tuberculous deformities, while of the English and Irish, the tuberculous conditions include nearly 50 %, as is also the case with the Scandinavians and Poles; the Germans show some 35 % tuberculous, while the colored race, despite the well-known susceptibility of the race to pulmonary tuberculosis, gives a percentage of only about 13.2, and the Italians and French are very nearly exempt. Of the American cases, 20 % show rachitic deformities, which are found in 20 % of the Germans, 15 % of the Irish, and only 10 % of the Scandinavians. Scoliosis seems the most abundant among the Germans and Bohemians, where it comprises over 20 %, against 15 % of the Irish and 6 % of the American deformities.

Chondrodystrophia Fœtalis.—P. W. Nathan,¹ before the Orthopedic Section of the New York Academy of Medicine, read a paper on this subject. Nathan stated that the majority of such individuals are either born prematurely or born dead at term. The affection is, therefore, a very serious fetal disease with a high mortality. The nature of the affection thus accounts for the fact that up to the present time practically all the reports of cases have simply contained postmortem findings. The appearance of these individuals is characteristic. The head is very large, and appears still larger in contrast with the diminutive length of the fetus as a whole. The extremities, moreover, are bent and deformed and occasionally fractured. All the epiphyses appear more or less enlarged, and those of the ribs produce a so-called rachitic rosary. There is frequently epicanthus. The lips and tongue are thickened, and the latter protrudes from the mouth. At times the head is so large that its circumference equals the length of the body, and in many cases exceeds it. Upon the development of the base of the skull depend the peculiarities and the shape of the head and the physiognomy. Most important in this respect is that portion of the base of the skull which Virchow designates the *os tribasilaris* and Hyrtl the fundamental bone. Another peculiarity of the base of the chondrodystrophic skull, first pointed out by Virchow, is a reduction in the angle formation at the junction of the vascular process with the occipital bone and the body of the sphenoid. We must, therefore, conclude that the conditions which are active in causing the peculiar physiognomy in this condition vary within rather wide limits. (1) Most frequent is the premature synostosis and consequent inhibition of the growth of the *os tribasilaris*, with or without shortening of the bones anteriorly; (2) shortening of the *os tribasilaris*, patent synchondrosis, and varying degrees of shortening of the bones anteriorly; (3) the decided shortening of the ethmoid nasal bones, with slight or no shortening of the *os tribasilaris* and patent synchondrosis. With these symptoms are associated changes in the saddle end (kyphosis of varying

¹Am. Jour. Med. Sci., Apr. 4, 1904.

degrees). Synostosis of the cicatrix or tribasilaris is, therefore, not, as the earlier writers assume, necessarily present in all cases of chondrodystrophia, nor is the os tribasilaris shortened in every case, so that the absence of either or both of these conditions does not decide the doubt, if any exist, that we have before us a chondrodystrophic tribasilaris or a new tribasilaris. A remarkably interesting phenomenon which occurs in a great many, and at some point in the skeleton in all cases of fetal chondrodystrophia, is what the Germans call the periosteal lamella. This peculiar formation was first described by Urtel. Anatomically considered, this is a well-defined morbid condition, and if we bear in mind its salient features, there can be no difficulty in differentiating it from other affections. The disease is not nearly so uncommon as some authors would have us believe; personally, the writer has examined 8 cases, a number of which are at present under observation. The literature of this subject is described in detail, and several interesting illustrations accompany the article.

Technic of Neuroplasty.—H. Spitzzy¹ presented by invitation, at the eighteenth annual meeting of the American Orthopedic Association, a study on this subject. He reported the results of experiments of his own, and from a comparison with the operating methods of other authors, stated the following with regard to the principles of neuroplasty. To connect the innervation region of the paralyzed nerve with the course of the intact nerve there are two different ways: (a) Either a part with a central basis is split off from the intact nerve, and this part implanted into a longitudinal slit of the paralyzed nerve, and fixed by a longitudinal cut; or (b) from the paralyzed nerve there is split off as large a piece as possible, which has a peripheral basis, and is implanted in the same manner in the longitudinal slit of the inactive nerve. Authors have endeavored to bring about a growing together and a reestablishment of the function by merely placing the nerve-stumps together, and have also been partly successful. Spitzzy considers this direct insertion to be safer, and has demonstrated it in many cases. As to the technic of the implantation itself, only the fastening of the part of the nerve to be implanted in a longitudinal slit of the functional nerve has given good results. The fixation must be effected by a longitudinal suture, as a transverse suture, owing to the extreme sensitiveness of the nerve-substance against pressure, destroys the conducting power and leads to a typical degeneration. The more nearly perfect the cut and suture are, the smaller is the damage caused. For a neurotization of the facial nerve the most favorable is nervus accessorius, before or after its passage through the sternomastoid. In a case of paralysis of the nervus peroneus the peripheral total or partial implantation into the nervus tibialis on the bend of the knee was technically an easy matter. In the case of a paralyzed nervus tibialis the opposite operation is quite as easy. Spitzzy has been successful in dissecting cadavers as well as in experiments on animals, in neurotizing from the nervus obturatorius. They occupy, on account of the divided nerve-supply, a special position. They are

¹ Am. Jour. Orthopedic Surg., Aug., 1904.

supplied from the nervus obturatorius, which the pelvis divides into two branches—one running along the surface and another deeper. The deeper one supplies the hip-joint, obturator externus, and the adductor magnus; the superficial one supplies the other adductors, the pectineus and gracilis, and the skin of the median region of the thigh. Owing to the short time, it is impossible to give a final opinion as to the results, but the writer believes that these plastic operations have quite the same chances as all others, and are in all events worth a chance, because all other methods are still open to the same objection.

Preliminary Report of a Series of Metabolism Observations Made in Atrophic Arthritis, Hypertrophic Arthritis, Osteitis Deformans, and the Normal.—Goldthwait, Painter, and Oswald¹ present a part of the work which has been carried on by or under the direction of the writers during the past few years in the endeavor to gain a better understanding of the etiology, pathology, and treatment of the so-called rheumatoid diseases. The work has been carried on in the histologic laboratory of the Massachusetts General Hospital, and in its development F. Pfaff and E. P. Joslin have been most helpful with their suggestions. Before performing any experiments in rheumatoid patients it was deemed advisable to make a thorough study of the literature concerning the metabolism in doubt. A valuable point of importance in this connection, only recently established by the work of Burian, Schur, Soetbeer, Ibrahim, and Salkowski, is the fact that uric acid is excreted in the greater part unchanged by mammals. This is certainly a final death-blow to the old view that uric acid is an antecedent to urea in the destructive metabolism of proteid. The writers described the method of carrying on the metabolism experiments in detail. As a summary, the results of all the experiments are grouped together. [This article is exhaustive, and so far as known, the most valuable contribution so far offered.]

A Clinical and Experimental Contribution to the Study of Lesions of Traumatic Origin of the Brachial Plexus.—R. Galeazzi² reported some cases illustrating this condition. The paresis and muscular paralysis may be explained by stretching or direct compression from the luxated vertebrae, or by the quite abundant extra-medullary extravasations. In almost all these cases there were symptoms of medullary lesions with those of the radices, so that it is difficult to distinguish the spinal lesions from those of the radices. A few surgical interferences reported give encouraging results. The difficulty is in finding the seat of the lesion and determining its degree.

Experiments to Determine Whether Plaster-of-Paris Contracts or Expands in Setting.—J. T. Rugh,³ at the annual meeting of the American Orthopedic Association, stated that in a symposium on plaster-of-paris during a former meeting of this association opposite views regarding this question were expressed by several of the members, and this gave Rugh the idea of determining which view was correct. Experi-

¹ Amer. Med., Apr. 2, 1904.

² Arch. di Orthopedia, Milano, 1903; Am. Jour. Orthopedic Surg., Aug., 1903.

³ Am. Jour. Orthopedic Surg., Aug., 1904.

ments were therefore made with two kinds of pure plaster—the body materials with plaster bandages combining both these varieties, and there were also noted the effects of salt and alum under the center. These have been tabulated, together with other facts of interest and importance. The appliance used in the experiments was devised by Rugh, the idea originating with the ordinary dynamometer used for testing the strength of the hand, though very much larger. While the actual expansion universally observed is very slight, amounting to not more than $\frac{1}{16}$ of an inch, yet there is sufficient proof that there is no cause for the fear that pressure-sores may develop from contraction of the plaster bandage, which fact in itself is of no small importance to the profession at large, as it will serve to render the users of this agent more cautious and more intelligent in applying it.

Final Results in Tendon-transplantation.—Hoffa¹ states that in order to obtain a good result in tendon-transplantation 4 conditions are necessary: (1) Perfect asepsis; (2) prevention of hemorrhage; (3) healthy muscle material; (4) the tendons must be united under certain tension. We can transplant with success only such muscles as possess some power of regeneration. It is also of the greatest importance, in fact, an essential condition, that the muscle which one wishes to transplant is united to the other tendon under sufficient tension. We know that every muscle possesses a certain amount of elasticity and tone, and that these are both lost in anterior poliomyelitis. We must, therefore, by means of the operation, restore, as far as possible, the elasticity and tone, and we can obtain such results only through shortening the muscle itself. In observing the results as a whole we cannot expect very much from an operation on a limb totally paralyzed. In another class of cases we can produce a certain amount of tendinous fixation of the joints by still allowing a certain amount of functional activity. Hoffa showed 50 such cases last April, upon which he had operated, to the German Surgical Society of Berlin. He advised the operative method of Lange which is a periosteal implantation; and regarding the operation of Nica-ladoni, believes that one should be used in conjunction with the other.

Inherited Deformity.—Heim² reported the case of a woman, aged 40, who, 20 to 21 years before, had suffered from an injury, a blood-poisoning of the right middle finger, which necessitated, 2 years later, amputation of the finger with the second metacarpal bone. Since then she had had 6 children, 4 of whom had cloven hands, shaped in the same manner as their mother's, with, in some cases, a loss of the third metacarpal bone. Heim also gave a history of a similar condition existing in 3 generations in another case. These reports are in accordance with the popular belief, but the satisfactory evidence of their occurrence is not often complete or forthcoming.

Report of a Case of Unusual Congenital Multiple Deformities.—H. P. H. Galloway³ reported a case of a patient presenting a combination

¹ Am. Jour. Orthopedic Surg., Aug., 1904.

² Jour. Am. Med. Assoc., Apr. 23, 1904.

³ Am. Jour. Orthopedic Surg., May, 1904.

of congenital deformities, and this, together with the fact that the resultant treatment was highly satisfactory, made it seem desirable to place the case on record. There was congenital anterior dislocation of the hips; the right foot was an extreme example of talipes equinovarus; the left foot was greatly supinated and slightly in the equinus position; the left knee presented a combination of extreme knock-knee and genu recurvatum. Further, when the right knee was flexed, it bent back, instead of anteroposteriorly, and the patella was at the outer side of the limb, instead of in front, this being due to the outward rotation of the femur, caused by the anterior dislocation. His whole posture was, of course, extremely awkward in appearance. The first operation consisted of a subcutaneous section of the plantar fascia and of the tibialis anticus of the right foot, and of the plantar fascia of the tibialis posticus and the internal lateral ligaments of the left foot, followed by forcible wrenching. At intervals of 3 to 6 weeks the feet were forcibly manipulated under anesthesia, the position being improved each time, until the deformity was practically wholly corrected. Locomotion was considerably impeded by the impossibility of flexing the right knee anteroposteriorly, to which reference has already been made. In order to remedy this a final operation, osteotomy of the right femur, was undertaken. Sound union occurred in about two months, and anteroposterior flexion of the knee was then possible. In all the patient was anesthetized 8 times.

Ankylosis of the Jaws.—G. L. Curtis¹ stated that permanent ankylosis is due to true osseous formation within the joint, and is rare, except in traumatic diseases. Several cases are reported, and a description of the apparatus and operative treatment is given.

Method of Studying the Pathology of Bone Lesions by the Röntgen-ray.—Feiss,² before the Boston Society of Medical Sciences, presented a paper in which he stated that it had for its chief aim the advancement of a method rather than the presentation of new facts. By such a method we may investigate as closely as possible the meaning of the shadows expressed by röntgen-ray images. It will give us, perhaps, not only accurate data for the interpretation of these images, but it may also serve as a means of studying bone lesions in pathologic specimens. In connection with this method two cases have been analyzed and some excellent illustrations are shown.

¹ Jour. Am. Med. Assoc., July 2, 1904.

² Jour. Med. Research, May, 1904, vol. ix.

ANATOMY.

By C. A. HAMANN, M. D.,
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BONES, JOINTS, AND MUSCLES.

A¹Bony Supracondyloid Foramen in Man.—Thos. Dwight¹ found on the inner side of the humerus a bony supracondyloid foramen. A process arises from the inner surface of the humerus, midway between the anterior and posterior borders, by a thin expansion of bone about 62 mm. above the trochlea, continues downward and meets another projection about 4 mm. broad, arising from the anterior surface of the trochlea. The median nerve ran through the foramen, while the brachial artery ran over it at the origin.

Frontal Sinus.—A. W. Lee² has made negative casts of the frontal sinus by pouring lead into that cavity. He has observed that the sinuses generally extend beyond the middle line and are quite irregular in their outline. They may be absent throughout life. Contrary to Sappey, his examination of the superciliary arch develops no precise information concerning the size of the sinus beyond, although generally a large superciliary prominence indicates a large cavity behind it. The right sinus was larger than the left in 13 out of 20 cases. It has been suggested that the frontal sinuses are being eliminated from the vertebrate skeleton by a process of evolution; their occasional absence in otherwise normal human craniums, and their irregularity in form, extent, and capacity, as well as their asymmetry, seem to point to this conclusion. But a comparison of the sinuses in a series of mammals shows no diminution in their size corresponding to the position of the species in the animal scale.

Accessory Patella.—Wm. Wright³ describes an accessory patella developed as a sesamoid bone in the iliotibial band. He surmises that such occurrences are not so very rare, the reason that they are not described being that the accessory patella fuses with the main bone and only gives rise to a protuberance upon it.

Os Subcapitatum.—Dwight⁴ describes a separate os subcapitatum found in each hand; it was placed in the distal end of the palmar surface of the os magnum.

Posterior Ethmoid Cells.—Onodi⁵ calls attention to the fact that

¹ Am. Jour. Anat., July 1, 1904.

² Johns Hopkins Hosp. Bull., Apr., 1904.

³ Jour. Anat. and Physiol., 1903, xxxviii, p. 65.

⁴ Anatom. Anz., xxiv, No. 91, 253.

⁵ Arch. f. Laryngol., Bd. xiv, Heft 2.

the most posterior ethmoid air-cell may be very close to the optic foramen, and be separated from it by a very thin lamina of bone. This fact may be of interest in connection with optic neuritis associated with disease of the ethmoid air-cells.

Septum in the Frontal Sinus.—Hansen and Pluder¹ describe a case in which there existed an abnormal septum in the right frontal sinus; this divided the cavity into two parts, and was not due to an ingrowth of some of the ethmoid cells.

Divided Parietal Bone.—G. Schwalbe² has been able to collect only 25 cases of divided parietal bones (*os parietale bipartitum*). This anomaly is accordingly quite rare; it is more common in children's skulls and in anthropoids, notably in the orang-outang. The occurrence of such an anomaly is not to be regarded as atavistic, but is due to hydrocephalus in the third month of fetal life. The parietal bone has two centers of ossification. Bolk³ describes a very rare anomaly in the skull of a newly born infant, in which the parietal bone was made up of about 40 small pieces, each arising from a separate center of ossification.

The Development of the Bones of the Pelvis and Extremities in the Human Fetus.—A. Clopatt⁴ has photographed bones of embryos from the fourth month up to the end of pregnancy. These had been preserved in alcohol or formalin. The sacral vertebrae, like the other vertebrae, possess 3 bony nuclei, one for the body and one for each arch. The nuclei of the first two vertebrae appear at the beginning of the fourth month, as also those of the first arch. During the fifth month the nuclei of the third body and the second arch appear; later, those of the fourth and fifth vertebrae and of the third arch. At the end of the seventh month all the centers of the bodies and arches are discernible. The *os ilium* can be seen during the fourth month, while the descending ramus of the ischium is recognized at the beginning of the fifth month. The *os pubis*, however, appears at birth. The ossification of the long bones occurs, according to Clopatt, in the following order: humerus, femur, radius, ulna, tibia, fibula. In the carpus no bony focus could be discovered, but the metacarpal and phalangeal bones show centers at the beginning of the fifth month. The calcaneum center appears at the seventh month; that of the talus, at the tenth month. The ossification of the metatarsal bone occurs at the same period as the metacarpal, although those of the toe vary somewhat.

Why the Living Bone is More Easily Fractured than the Dead.—H. Zuppinger⁵ seeks to explain the fact that living bone is more readily broken than the dead. The difference in temperature and in blood-pressure does not suffice to explain the phenomenon. Muscular tone and contraction are the responsible factors, although arterial pressure has some influence.

The Structure of the Extensor Apparatus of the Knee-joint.—

¹ Arch. f. Laryngol., Bd. xiv, Heft 2, p. 404.

² Zeit. f. Morphol. u. Anthropol., Bd. vi, p. 361.

³ Petrus Camper, D. II, Atl. p. 211.

⁴ Finska Läkaresällsk. Handlingar, 1903, Bd. xiv, No. 9.

⁵ Anatom. Hefte, Heft lxxiii, 1904.

Georg Schmidt¹ describes in detail the somewhat complicated ligamentous and fascial structures at the side of the patella, which serves as a partial insertion of the quadriceps extensor. Mikuliez has applied to the fascia, aponeurosis, and capsular ligament at the side of the patella the name "ligamenta parapatellaria." A study of these structures is of practical interest in connection with the subject of fracture of the patella. The varying amount of displacement of the upper fragment and the differing degrees of functional impairment after fractures of the patella depend to a considerable extent upon the amount of laceration of these "ligamenta parapatellaria."

An Uncommon Form of the Musculus Sternalis.—L. Hamema² describes a peculiar form of the musculus sternalis found in a male subject. The muscle, which was present only on the right side, was made up of two parts: the superficial portion extended from the cartilage of the third rib to the sternum; the deeper portion extended from the clavicle to the third rib and passed through the pectoralis major. That portion of the pectoralis major which arises from the cartilage of the third rib was absent; this arrangement favors the view that the musculus sternalis is a divaricated portion of the pectoralis major.

Contraction of Muscular Fibers.—Forster³ has endeavored to ascertain the condition and form of the muscle-cell and of the nucleus during contraction. His results are summed up as follows: (1) The muscle contracts by rolling up or curling up spirally. (2) The nucleus partakes (passively) in this spiral movement; it is, therefore, elongated in the resting state and spirally contracted when the muscle contracts. (3) The degree of spiral "rolling up" of the nucleus is an index of the amount of contraction of the cell.

THE NERVOUS SYSTEM.

The Continuity of the Nerves through the Vertebrate Retina.—Criticizing the current view as to the layer of "ganglionic cells," H. M. Bernard⁴ states that the thick cytoplasmic axis-cylinder process joining the ganglionic cell to the optic nerve has no existence. It is only in the higher vertebrates that the appearance of ganglionic cells is presented. In lower forms most of the ganglionic nuclei either have no cytoplasm at all, and are simply nuclei, or else they have a mere trace of it. This description applies to all the "cells" of the retina, so that the diagrammatic bipolar cells of the middle layer have no more real existence as fixed morphologic elements than have the multipolar ganglionic cells. The apparently free nuclei are, however, connected by exquisitely delicate threads emanating from the intranuclear network, one here and there, and running from nucleus to nucleus. A description of these connecting filaments is given between the nuclei of the middle nuclear layer, between the nuclei of the outer nuclear layer (the rod nuclei),

¹ Arch. f. Anat. u. Physiol., 1903, 2, 3, and 4, p. 107.

² P. Camper, 2 Deel. Afl. 4.

³ Anatom. Anz., 1904, Bd. xxv, Nos. 14 and 15.

⁴ Quart. Jour. Micr. Sci., N. S., Dec., 1903, No. 187, vol. xlvii, part 3.

between the nuclei of the inner nuclear or ganglionic layer, and again between these and the nuclei of the middle layer. In spite of the extreme delicacy of the filaments they can persist over considerable distances, establishing organic connection between the nuclei or systems of nuclei which are far apart, so that all the nuclei of the retina are connected together into an organic system. Bernard believes this "protomitotic" system to underlie the structure of all protoplasm, and confirming and going beyond Heitzmann's "syncytium," shakes the foundations of the cell-theory. The retinal nuclei are the nodes of the protomitotic system. Each node is a still closer reticulum, in which chromatin accumulates. Distally, the filaments of the system run out as a fringe gathered into groups by supporting vesicles—the rods. Proximally, the filaments are gathered as the "neuro-primitive Fibrillen" into the nerve-strands which connect the retina with the brain.

Brain of a Bilateral Anophthalmus.—V. Hauke¹ found, in a case of complete absence of the optic nerve, that the external geniculate body was chiefly made up of neuroglia with scattered and atrophic ganglion-cells. The anterior quadrigeminal body had no stratum zonale. The nuclei of the motor nerves of the eyeball and the posterior longitudinal bundle were normal. In the cortex of the neighborhood of the calcarine fissure the fourth layer was absent; there was no increase in the first layer, and the other layers presented a pretty uniform atrophy.

Histology of the Rods and Cones.—R. Hesse² has studied the retinas of 23 species of animals, and finds that the rods and cones are surrounded by spiral fibrillas which are to be regarded as neurofibrillas. These fibrillas had been seen by W. Krause and by Ritter, but have not been generally recognized.

Development of Nerve-fibers.—V. Koelliker³ sums up his views as follows: 1. All nerve-fibers are derived from cells of the neuraxis and ganglions, which send out protoplasmic processes and end without uniting with other nerve-cells. 2. The central processes are not surrounded by cells, and terminate as fine ramifications about other cells. 3. The peripheral motor and sensory elements and the cells of the ganglions are surrounded by special cells which form the sheath of the ganglion-cells and the myelin of the nerve-fibers; the myelin applies itself to the axis-cylinders, and then forms a sheath for them. All these cells are of mesodermic origin and increase by indirect cell-division. 4. The neuron theory is, therefore, correct. 5. The above statements apply to vertebrates, but it is very likely also to articulates and mollusks. However, the nerves of the lower forms are developed in a simpler manner and are not to be compared with those of the higher types.

Taste-fibers.—Harvey Cushing⁴ has carefully investigated cases after the removal of the Gasserian ganglion, to ascertain what, if any, disturbance of the sense of taste existed. He finds, contrary to Gowers and Stewart, that there is no permanent or complete loss of the sense

¹ Arbeit. aus dem Neurolog. Inst. an der Wiener Univ., Bd. x.

² Zoolog. Jahrb., 1903, Suppl. vii.

³ Anatom. Anz., Bd. xxv, No. 1.

⁴ Johns Hopkins Hosp. Bull., xiv, pp. 71, 144, 145.

of taste on the anterior two-thirds of the tongue. He states that it is very probable that the fifth nerve conveys no taste-fibers either from the posterior or anterior portion of the tongue to the brain.

Number of Medullated Fibers in the Roots of the Spinal Nerves.

—C. E. Inghert¹ found that the area of the cross-section of the vertebral roots of the left spinal nerves in the body of a large man was 26.5 sq. mm., and that of the dorsal roots was 54.93 sq. mm., a proportion of 1 to 2.07. He estimates the number of medullated fibers in the ventral roots at 703,700, and in the dorsal roots, 653,627.

Nerve-endings in the Nail-bed.—A. G. Dogiel² finds that the nerves of the nail-bed form a ground plexus, which lies superficial to the blood-vessels; from this plexus the filaments ascend at varying angles. The nerve-endings consist for the most part of nonencapsulated masses of fibrillas, of an intrapapillary network and loops and branching terminal filaments. There are no typical Pacinian corpuscles, nor are there any touch-corpuscles of Meckel.

The neuron theory has been repeatedly attacked of late; among others, by Durante³ and Bethe.⁴ In the opinion of most of those qualified to judge, however, conclusive evidence against its correctness has not been brought forward. Déjérine⁵ strongly upholds the doctrine and answers some of the objections to it. Van Gehuchten⁶ claims that the results obtained by Ramon y Cajal's new method of staining do not support Bethe's views. He states that there is at present but one argument against the neuron theory, viz.: the autoregeneration of nerves, the possibility of which has been shown by Bethe.

Brain Weight of Infants.—H. Pfister⁷ has continued his investigations on the weight of infants' brains; among other things he finds that the left hemisphere of the cerebrum frequently exceeds the right in weight; the cerebellum increases relatively rapidly in weight in the first few years; the brain weight of boys is greater than that of girls.

Nerves of Membrana Tympani.—Forns⁸ has found cells on the inner surface of the drum-membrane which could be stained with methylene-blue; they are not nerve-cells. There are no intraepithelial nerve-fibers on the inner surface of the membrana tympani. There is a delicate, subepithelial network of nerves in the mucous membrane of the tympanum.

Nerve-endings in the Pleura.—A. S. Dogiel⁹ found in the human pleura encapsulated nerve-endings as well as others which were without a capsule. Typical Vater's corpuscles, and modifications of these (the Golgi-Mazzoni bodies), were met with, the latter being more numerous. The nerve-endings and the mode of distribution of the fibers correspond in arrangement and structure to those described by Dogiel in the peritoneum. Sensory nerve-endings like those in the pleura were also found

¹ Jour. of Comp. Neurol., 1904, vol. xiv, No. 3.

² Arch. f. mikr. Anat., 1904, Bd. lxiv.

³ Rev. Neurol., 1903, No. 22.

⁴ Allg. Anat. u. Physiol. des Nervensys., Leipzig, 1903.

⁵ Rev. Neurol., 1904, No. 5.

⁶ Le Nevraxe, 1904, iv.

⁷ Arch. f. Kinderheilk., 1903, xxxvii.

⁸ Arch. f. Ohrenheilk., Bd. lx, p. 112.

⁹ Arch. f. mikr. Anat., Bd. lxii, Heft 2.

in the intercostal muscles. The nerves of the pleura are all derived from the intercostals, according to Dogiel.

MISCELLANEOUS.

Hepatic Cells.—L. Adler¹ finds that in fetal and infantile life there are normally lighter colored cells alongside the usual polygonal cells in the liver. These are young hepatic cells, inasmuch as they contain a smaller amount of fat and pigment and present mitotic changes. In adults one occasionally finds cells which are lighter in color than the others. In regenerative cell-proliferation, such as occurs in cirrhosis, primary carcinoma, etc., there may be found such pale cells analogous to those found in the fetus. The presence of these cells and evidences of proliferation may be of diagnostic value.

Development and Histology of the Male Urethra.—F. Herzog² states that the genital eminence arises as a mesenchymal proliferation at the anterior border of the cloaca. At the beginning of the third month sexual differences can be detected; in the female the genital eminence curves downward, whereas in the male it does not. The urethra is formed in the body of the penis, as well as in the glans, by a splitting of the urethral septum and subsequently by a union of this cleft. The first evidences of a prepuce appear in the epithelium, the cells of which rapidly increase in number in the constriction back of the glans. Muscular tissue is found only in the proximal third of the urethra; there are an internal longitudinal and an external circular layer of fibers. There are two kinds of glands, one of which lies in the mucosa; the other extends more or less deeply into the submucosa. The so-called lacunas of Morgagni are not glands but are epithelial pearls embedded in the mucous membrane.

Structure of the Kidney.—O. Stoerke³ has studied the development of the tubules by the reconstruction method. The entire tubule, together with the capsule of Bowman, as far as the collecting tubule, is developed from the so-called "S-shaped structure." The lighter and wider limb of Henle's loop is the descending one, and not the ascending one, as was formerly believed. The tubules of the fetal kidney, except the collecting tubules, are not circular on transverse section, but are flattened and distorted in various ways as a result of pressure and in order to adapt themselves to adjacent structures; the same is true of the capsule of Bowman.

Development of the Islands of Langerhans.—H. Kuster⁴ reaches the following conclusions from his studies of human embryos: (1) The islands of Langerhans appear early in embryonic life as anatomic entities. (2) The first trace of these bodies consists of budding processes from the ducts. (3) These early outgrowths present 3 characteristics—(a) The nuclei of the cells are centrally placed; (b) the cells arrange themselves

¹ *Beit. z. path. Anat. u. allg. Path.*, 1904, xxxv, 1, p. 127.

² *Arch. f. mikr. Anat.*, 1904, Bd. lxiii.

³ *Anat. Hefte*, 1904, 72 Hefte (Bd. xxiii, Hefte 2).

⁴ *Arch. f. mikr. Anat.*, 1904, Bd. lxiv.

in rows; (c) there are intimate relations to the capillaries. (4) The islands soon separate from the ducts. (5) The growth of these islands ceases at about the end of fetal life, and from this time on they remain unchanged in size and structure throughout life.

The Muscularis Mucosæ.—B. Bienenfeld¹ has examined the muscularis mucosæ of the alimentary canal of various animals to ascertain whether the character of the food had any influence on its thickness. It was found that in those animals in which the mucous membrane is liable to be injured by hard and sharp objects, such as bones, the muscularis mucosæ is thicker in the stomach and upper part of the small intestine than in animals not so exposed.

Divided Malpighian Corpuscles in the Kidney.—E. Beer² has found the malpighian corpuscles divided into two parts, both together being only slightly larger than a normal malpighian corpuscle; in other cases they were considerably larger. These anomalies were found in kidneys which presented no evidences of disease.

Anatomy of Prostate.—Waterson³ shows that the superficial layer of the triangular ligament is not intimately related to the urethra, but is attached around the margins of the bulb, and that Cowper's glands lie in intimate relation to the deep aspect of the latter and are not separated from it by a strong membrane. He calls attention to the strong thick anterior part of the levator ani muscle, and the strong character of the deep layer of the triangular ligament, which is pierced by the urethra and supports the prostate.

The Efficiency of the Periureteral Arterial Plexus, and the Importance of its Restoration in the More Radical Operation for Carcinoma Cervicis Uteri.—John A. Sampson⁴ demonstrates in his researches that the arteries of the ureter, branches of the renal, spermatic, or ovarian, the vesical and the uterine, form free anastomoses and give rise to the periureteral arterial plexus. The periureteral plexus is formed as follows: Branches which are named ureterosubperitoneal arteries arise from the larger vessels, as the aorta, renal, ovarian, iliac, uterine, and vesical arteries. These arteries divide into two branches—first, a ureteral branch, which helps to form the periureteral arterial plexus; second, a subperitoneal branch, which supplies the tissue about the ureter. The ureteral arteries divide into ascending and descending branches, which anastomose freely with the branches of a lower or higher ureteral artery. Thus relatively large trunks run longitudinally along the ureter from the kidney to the bladder. From the trunks smaller branches are given off, which run in the perimuscular tissue of the ureter. The subperitoneal divisions of the ureterosubperitoneal vessels supply the tissue surrounding the ureter and anastomose with each other. He was unable to demonstrate any anastomosis between the small vessels in the muscular coat. He believes that the destruction of the periureteral plexus for a short distance will cause necrosis, but if the larger

¹ Arch. f. d. ges. Physiol., 1904, xcviii, 7 and 8, p. 389.

² Zeit. f. Heilk., 1904, xxiv, 10, p. 334.

³ Brit. Med. Jour., June 11, 1904.

⁴ Johns Hopkins Hosp. Bull., Feb., 1904.

trunks from the kidney to the bladder are cut, the ureter will be nourished by the plexus.

Thymus Gland.—L. Kaplan¹ has studied the topography of this body in the newborn and also its nerve-supply. He found that there is constantly a branch of the vagus supplying it; this branch arises a little above the origin of the recurrent laryngeal, and passes downward parallel with the common carotid artery, to enter the thorax. From this branch there are also given off 2 or 3 filaments which pass to the heart and aorta. These facts are of interest in connection with the cases of sudden death due to hyperplasia of the thymus.

Parathyroid Body.—H. Peterson,² in the examination of 100 bodies, found this body constantly present. There are no medullated nerve-fibers in the parathyroid. The nuclei of the cells are placed eccentrically.

Coccygeal Body.—Walker³ has examined the coccygeal body or "gland" of fetuses and adults and finds that it is made up, for the most part, of specific cells which are surrounded by tortuous capillaries. In the fetus the organ is composed of a single mass of cells; after birth connective tissue grows into the gland and separates groups of cells from one another. Smaller or larger collections of cells may be separated from the main gland. With increasing age the connective tissue proliferates at the expense of the specific cells. There is at no time a duct. He classes the coccygeal body with the glands having an internal secretion; the arrangement of the bloodvessels and their internal relation to the gland-cells is an additional proof of the correctness of this view. The blood is, however, always separated from the cells by a layer of endothelium. Schafer⁴ contends that the coccygeal body is not to be classed with the ductless glands, and believes that it most resembles in structure and function the intercarotid body.

Determination of Sex.—O. Schultze⁵ offers a critical and exhaustive review of this subject. He believes that the sex is already determined in the ovum, and, therefore, that fertilization has no determining influence. All his experiments, carried out on mice over a period of years, have led to negative results; the age of the parents, hunger, diet, etc., had no effect in determining the sex.

Influence of Radium on Embryonal and Regenerative Processes.—Schafer⁶ has endeavored to ascertain the influence that radium rays exert upon the lower forms of life and upon elementary tissues. He found that the rays had a marked inhibitory action upon cell-division, upon regenerative processes, and upon embryonal growth. This effect appears only after a certain period of latency, however. H. Heinicke⁷ also found that the rays had a marked effect upon animal tissues. In the spleens of mice that had been exposed to the rays he found that the whole organ was poor in cellular elements, so that the pulp looked as though the cells had been penciled out. Leukocytes were almost entirely

¹ Inaug. Diss., Berlin.

² Virchow's Arch., Bd. clxxiv, Heft 3, p. 413.

³ Arch. f. mikr. Anat., Bd. lxiv. ⁴ Anatom. Anz., 1904, Bd. xxv, Hefte 7 u. 8.

⁵ Arch. f. mikr. Anat., 1903, Bd. lxiii, p. 197.

⁶ Anatom. Anz., 1904, Bd. xxv, No. 12, Heft 3.

⁷ Münch. med. Woch., 1904, No. 31.

absent from the malpighian corpuscles. The pulp contained many pigment-cells. The changes produced by the rays in lymphoid tissue consist in a degeneration of the nuclei of the lymphocytes, and are similar to those produced by the röntgen rays.

Mammary Glands of the Newborn.—H. Raubitschek¹ has examined the breasts of male and female in the last month of uterogestation and the first two months of infantile life, and concludes that the yellowish, creamy fluid secreted by the mammas of many newborn infants has nothing to do with lactation. This substance consists for the most part of cast-off gland-cells. The dilation of the ducts and the casting-off of the cells occur so frequently that they are to be regarded as physiologic.

Coronary Arteries.—A. Banchi² has studied the coronary arteries of man and other vertebrates, to ascertain the normal arrangement and variations from this. He confirms the commonly accepted statement that there are two coronary arteries; when a third artery is present, it is in one-third of the cases a branch of the right coronary, which has become independent. The level at which the arteries arise corresponds to the free border of the semilunar valves during systole. His description of the normal type which is found in 80 % of cases differs materially from that given in most text-books.

Bloodvessels of the Mucous Membrane of the Stomach.—Disse³ describes the arteries entering the gastric mucosa as small vessels (0.05 to 0.07 mm. in diameter). They are end-arteries. About 25 of these end-arteries supply a square centimeter of the mucosa; the area of distribution of each is quite small, therefore, and the fact that they are end-arteries does not aid in the explanation of the cause of gastric ulcers, for the area of distribution of each vessel is much less than that of a gastric ulcer. However, the discovery of these end-arteries accounts for the occasional occurrence of hemorrhage into the stomach after ligation of the omentum, inasmuch as such hemorrhage is due to occlusion of the vessel by emboli.

The Fate of the Red Blood-corpuscle in the Normal Organism.—Franz Weidenrich⁴ says that although a great deal of literature has been published concerning the blood, little has been written concerning the fate of the red blood-corpuscle, that is, after completing its physiologic function, to trace it through its morphologic changes. Since Quincke's researches we know that the erythrocytes are replaced by new ones in a short space of time; that a great many are used up in the formation of bile-pigment. Albrecht and other authors have shown that the complete red corpuscles are drops whose principal constituent is a ferruginous solution of albumin, and the drop is inclosed in a thin membrane. The method of dissolution of the red corpuscle is not so simple. The form of the corpuscle is changed by the absorption of water from a bell to a globular shape; then, upon further absorption of water, the globe bursts and the membrane remains as a shadow. Another method of the destruc-

¹ Zeit. f. Heilk., 1904, xxv, 1, p. 16.

² Arch. Ital. di Anat. e di Embr., 1904, vol. iii.

³ Arch. f. mikr. Anat., 1904, lxiii, 3, p. 512.

⁴ Anatom. Anz., Dec. 5, 1903.

tion of the corpuscle lies in its separation into small granular bodies with perceptible change of the endosoma. The erythrocytes shrink to small irregular bodies which have a special affinity for fuchsin, eosin, and orange. These granules separate into smaller bodies of different sizes and shapes and retain their affinities for the above stains. The greater portion of these granules are taken up by the leukocytes, and on account of their affinity for the above stains are known as eosinophiles. These granules are principally found in such blood-making organs as the spleen, bone-marrow, and lymphatic glands. The degenerative elements of the red corpuscle can also be taken up by the endothelium of vessels, especially of the bone-marrow, spleen, and lymph-glands, and the liver.

The Veins of the Pancreas.—W. Tonkoff¹ says that the numerous fine branches of the veins at the head of the pancreas terminate in anastomoses of 3 pancreaticoduodenal veins—an anterior, a superior posterior, and an inferior, the first of which ends in the gastroduodenal vein, the second in the portal vein, and the inferior generally terminates in the superior mesenteric vein, and usually arises from two branches—the anterior and posterior rami of the inferior pancreaticoduodenal vein, which anastomose with the upper pancreaticoduodenal veins between the head of the pancreas and the duodenum. The veins of the head also terminate in the gastroduodenal, mesenteric, and portal veins. From the body of the pancreas 10 to 15 small veins enter the coronary, the inferior mesenteric, and splenic veins. Those from the tail of the pancreas end in the splenic and gastrosplenic veins, rarely in the vena gastrobrevia. The pancreaticomagna runs from left to right along the body of the pancreas, and generally terminates into the end of the inferior mesenteric vein; sometimes into the splenic or superior mesenteric vein. Large veins also run from the pancreas to the portal, splenic, coronary, and gastrosplenic veins. In the pancreas the veins form numerous anastomoses of considerable size. All of Tonkoff's observations have been made on normal cadavers, which were injected through the arteries and portal circulation.

Development of Lymph-glands.—K. A. Klyne² finds that in the development of lymph-glands there is first formed a plexus of lymph-vessels; within this plexus there are formed aggregations of cells and bloodvessels which differentiate into nodules. The surrounding lymphatics fuse and form the marginal sinus, which leaves free one place in the gland, the hilum, at which lymph-vessels and bloodvessels enter. The cells of the reticulum are derived from the endothelium of the lymphatics; the trabeculas are remnants of connective tissue. Glands often remain microscopic in size and rudimentary; frequently several adjacent glands fuse.

Lymphatics of the Esophagus.—K. Sakata³ finds that the lymphatics of the esophagus arise in the deeper portion of the mucosa and in the muscularis. They form a close network in the mucous membrane; in the muscular coat there is a network which is, for the most part, on the

¹ Roussky Vratsch, 1903, No. 20. ² Arch. f. mikr. Anat., 1904, lxiii, p. 606.

³ Mitth. aus. d. Grenz-Geb. d. Med. u. Chir., 1904, xi. p. 634.

outer surface, and is made up of much smaller vessels than those of the mucosa. These two networks do not communicate with each other. The vessels leaving the mucous membrane either pierce the muscular coat at once and pass to the adjacent glands, or they run for a variable distance in the submucosa before they penetrate the muscularis. The glands may be subdivided into those which are adjacent to the esophagus and those which are placed at a distance; the former are the more numerous, the only distant glands being the deep inferior cervical. The paralysis of the recurrent laryngeal nerve seen in some cases of cancer of the esophagus is to be attributed to pressure upon the nerve by the carcinomatous glands which surround it.

Lymphatics of the Appendix.—Polya and Navratel¹ have investigated the lymphatics of the appendix by Gerota's method of injection. The fluid was injected into the muscular and submucous coats through the peritoneum; in all the injections a fine reticulum of lymph-channels appeared in the peritoneum. All the lymphatics of the appendix except one vessel which leaves the proximal end of the organ pass along with the appendicular artery toward the glands at the base of the mesoappendix. The lymphatics of the end of the cecum and of the last part of the ileum pass to the ileocecal glands. In general it may be stated that all the lymphatics of the appendix pass to the mesenteric glands.

Absence of Spleen.—C. Sternberg² describes a case in which the abdominal branches of the aorta were normal as to size and position, except that the splenic artery was very small and supplied the pancreas, and finally terminated in the great omentum. Accessory spleens were not found nor was compensatory enlargement of the abdominal lymph-nodes present. Microscopic examination of the blood and bone-marrow proved absolutely negative. Since the patient reached an advanced age in comparatively good health, another proof is offered that the spleen is not essential to the normal functions of the body.

F. B. Mallory³ discusses a hitherto undescribed fibrillar substance produced by connective-tissue cells. The tissue is treated in the following manner: (1) Fix in Zenker's fluid; (2) stain paraffin sections in a 1% aqueous solution of acid-fuchsin for 5 to 20 minutes; (3) wash quickly in water (not over 5 seconds); (4) place in a 1% aqueous solution of phosphomolybdic acid for 5 minutes or longer; (5) wash quickly in water (not over 5 seconds); (6) stain in the following anilin-blue mixture for 1 to 5 minutes. Anilin-blue soluble in water (Grubler), 0.5; orange G (Grubler), 2.0; oxalic acid, 2.0; water, 100.0; (7) wash quickly in water (not over 5 seconds); (8) wash thoroughly and dehydrate in several changes of alcohol; (9) clear in xylol; (10) mount in balsam. Connective-tissue cells produce, in addition to elastic fibers and the ordinary intercellular fibrils, a third variety of fibrils (fibroglia fibrils) which differ from them chemically and morphologically, and which have apparently the same staining properties as the coarse, differential staining (myoglia)

¹ Abstr. in Zent. f. norm. u. path. Anat., Bd. i, p. 12.

² Virchow's Arch., vol. clxxiii, No. 3.

³ Jour. of Med. Research, Boston, Dec., 1903.

fibrils of smooth muscle-cells. The fibroglia fibrils bear the same relation to the connective-tissue cells that neuroglia fibrils bear to neuroglia cells. They are present in great numbers in all actively growing connective tissue, both of inflammatory and of tumor origin. They are scarce in normal tissues, except, perhaps, in certain situations; they apparently form the true basement-membrane of the tubules of the kidney, of the coil-glands of the skin, and of the glands and ducts of the breast. They also occur in abundance beneath the endothelium lining arteries and the larger veins.

The Islets of Langerhans of the Pancreas.—The researches of H. H. Wale¹ have enabled him to confirm the views of Lewaschew, Vischiger, Maximow, Tschassownikow, and Laguesse, who have described changes in the islets corresponding to stages of activity in the pancreas. In resting glands of dog, cat, rabbit, and toad the intermediate forms described by Lewaschew were observed. In the toad evidences were also found of reconstruction of secreting alveoli from islets and of cell-multiplication in the islet stage. Exhaustion and starvation caused extensive conversion of the secreting tissue of the gland into islets. Occluding the pancreatic duct caused interstitial fibrosis, with destruction of pancreas and conversion of tubules not destroyed into islets, "but the preformed islets showed no special immunity from destruction." Wale concludes: "The experiments leave the question of the function of the islets undecided, but the results of occlusion of the duct are in favor of Laguesse's view that they represent an internally secreting stage in the life of the pancreatic tissue."

¹ Proc. Roy. Soc. London, Feb. 24, 1904.

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